

APRIL 8, 1915

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MOTOR AGE



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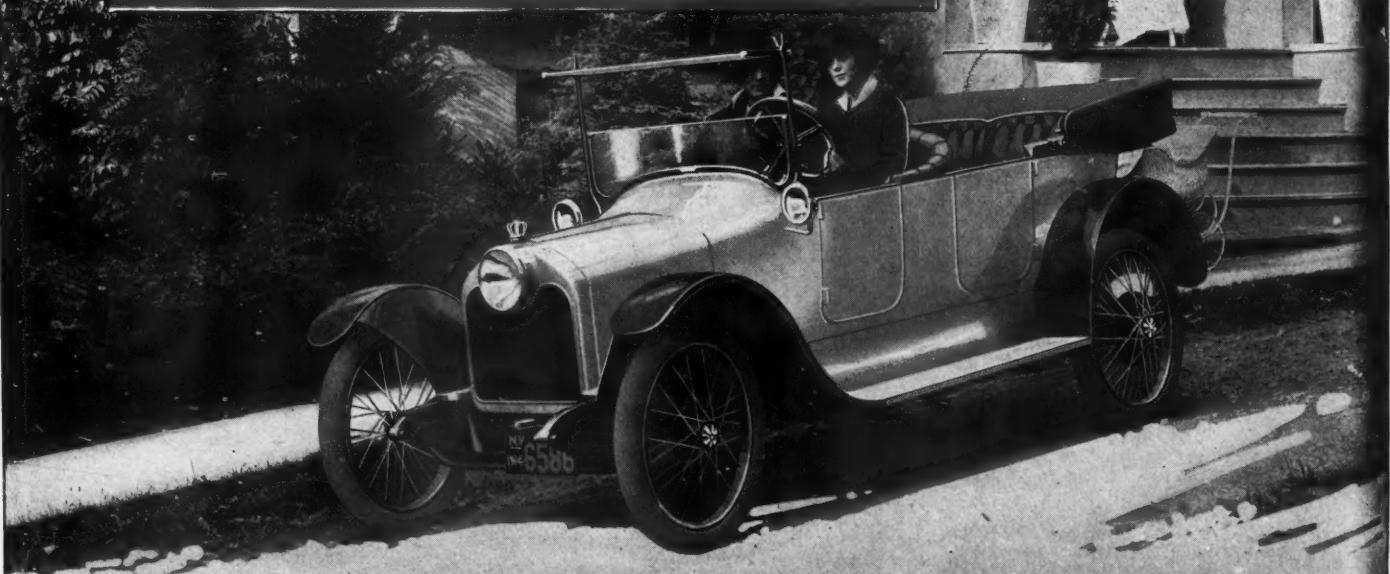
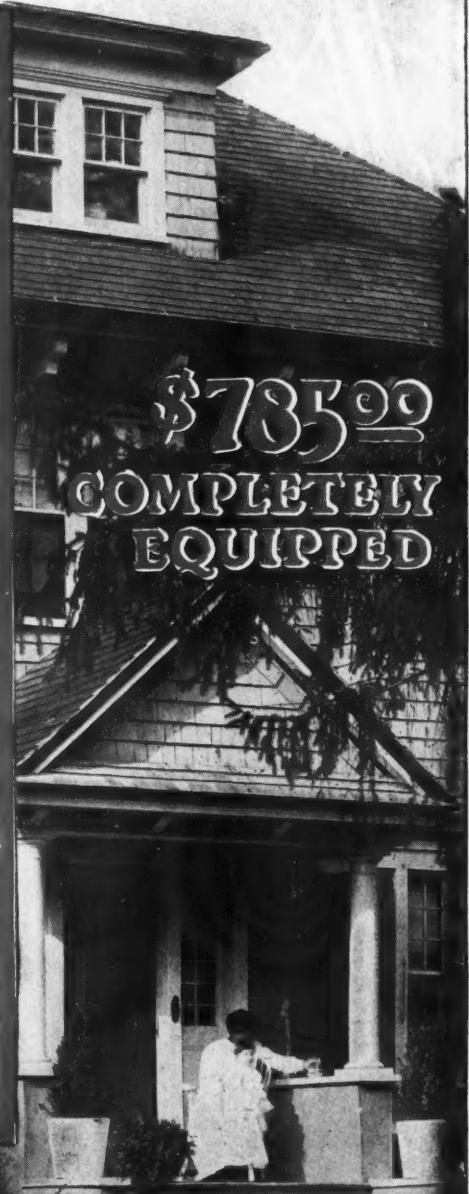
You are offering a foreign car, with all that term implies—an automobile of French design mechanically, as well as in graceful foreign body lines—at an American price.

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This is one of many reasons that make the BRISCOE the easiest and most thoroughly satisfactory car for dealers to handle.

CONSIDER THE BRISCOE, FROM ITS UNUSUALLY SMART EXTERIOR TO THE INNER-MOST PARTS OF ITS MECHANISM, AND YOU WILL FIND BY FAR THE BIGGEST VALUE, DOLLAR FOR DOLLAR, TO BE FOUND IN ANY CAR.

A liberal contract is offered to all responsible live-wire dealers who wish to increase their profits by the sale of BRISCOE cars. But territory is being allotted fast right now. Better get in touch with us without delay.



BRISCOE MOTOR COMPANY INC. JACKSON MICHIGAN



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LOCKPORT,
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The name Covert stands for quality. It means an efficiency in power transmission that is unsurpassed. It is the recognized standard in its field. Its superiority is shown by predominance in cars and trucks that are noted for their quality.

If you are striving to build cars that shall give the utmost in service you cannot do better than to incorporate COVERT TRANSMISSIONS in them. It will be profitable for you to consult our engineers regarding the adoption of COVERT TRANSMISSIONS for your cars or trucks.

**SALES OFFICE
DETROIT,
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COVERT MOTOR VEHICLE CO.

Monitor Motor Cars

Monitor cars deliver the message of low fuel and tire cost for the owner, on account of the light weight and unusually steady driving power. The motors deliver a surplus of power; and in the matter of easy riding quality the Monitor is in a class by itself.

Consider the Specifications. Consider the prices

Specifications 4-30

Unit power plant, block motor $3\frac{3}{4} \times 4\frac{1}{4}$, multiple disc clutch, chrome nickel steel transmission with center control, Splitdorf high tension magneto, Schebler carburetor, Disco electric generator and starter, Hartford universal joint, Russel axles with Hyatt bearings, streamline body, one-man mohair top, wheelbase 108 inches, weight 2200, tires $32 \times 3\frac{1}{2}$ with demountable rims, touring car and roadster on standard chassis.

Price \$795, f. o. b. Columbus, O.

Specifications 8-35

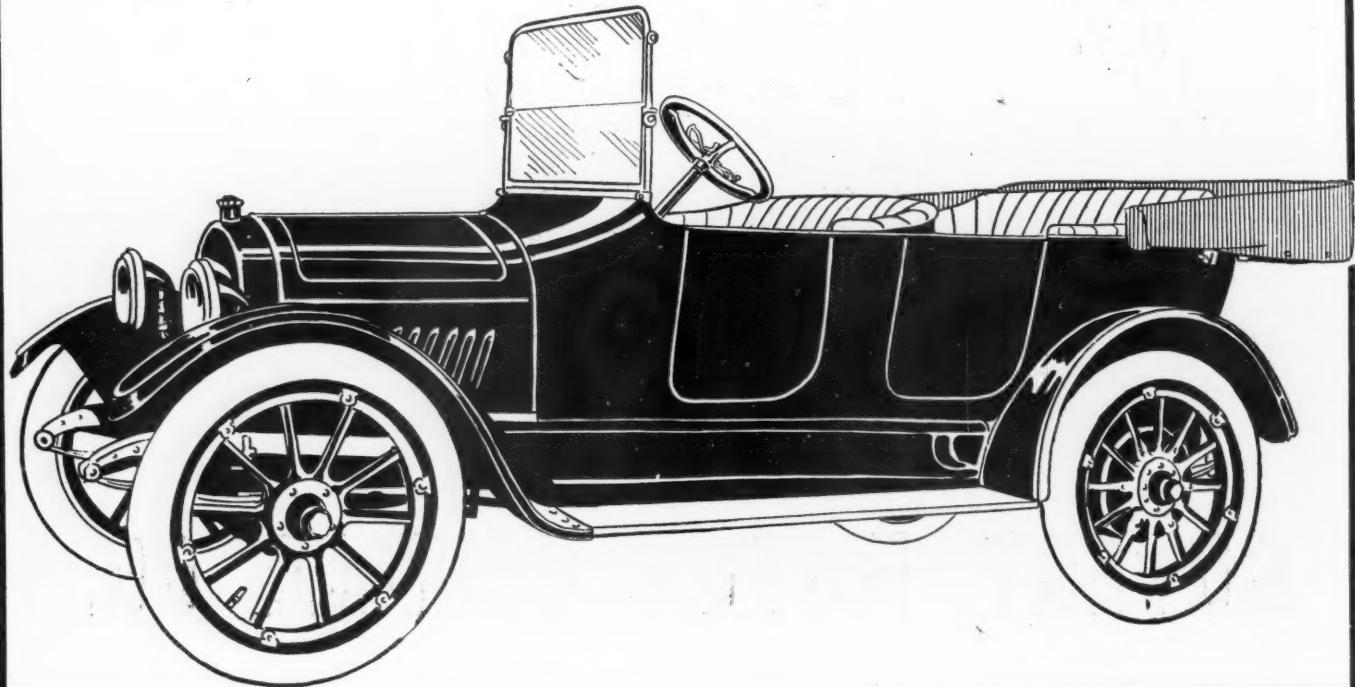
Unit power plant, two blocks set at 90°, single cam shaft, multiple disc clutch, chrome nickel steel transmission with center control, electric self-starter in single unit, special carburetor, Timken axles and bearings, Spicer universal joints, streamline body, silk mohair top, vacuum system for gasoline, wheelbase 112 inches, weight 2400 pounds, tires 33×4 , non-skid in the rear, demountable rims.

Price \$1275, f. o. b. Columbus, O.

WRITE FOR DETAILED DESCRIPTION

THE CUMMINS AUTO SALES COMPANY

Factory and Office: 402 Mt. Vernon Avenue, Columbus, Ohio



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Volume XXVII

April 8, 1915

No. 14

C o n t e n t s

GASOLINE ON THE BIG LOT.....	5
Being a story on the various uses the motor car is put to by the circus folk	
EDITORIAL—SOME PROBLEMS OF THE JITNEY—SKILL IN RACE DRIVING	12
MASSACHUSETTS EXPECTS TO TAG 95,000 CARS THIS YEAR....	13
TACOMA TRYING NEW IDEA IN SPEEDWAY CONSTRUCTION....	14
Asphalt surface to be used over planking	
BAY STATE SOLONS PROVE SANE ON MOTOR LEGISLATION....	15
Many absurd measures killed in committee	
APRIL A BUSY MONTH WITH DETROIT MANUFACTURERS.....	16
Fast production maintained by car makers	
QUAKERS PROBE INTO JITNEY SITUATION.....	18
Philadelphia official reports results of trip	
CHICAGO TAXICAB RATES ARE SLASHED.....	19
Rivals quote prices lower than legal figures	
DAIRY PRODUCTS PAY FOR FARMERS' CARS IN WISCONSIN....	20
Outlook in Badgerland as predicted by L. E. Meyer	
POEM—BOSSY MAKES THE MOTOR GO.....	21
ACCESSORY BUSINESS ONE OF GIANTS OF THE INDUSTRY.....	25
System necessary to meet growing demands of motorists—How the Gibson company of Indianapolis handles wholesale orders	
MOTOR CAR DEVELOPMENT.....	29
Description of the new Dorris six-cylinder	
INDEX TO ADVERTISEMENTS.....	94

DEPARTMENTS

See America First.....	13	Coming Motor Events.....	38
Routes and Touring Information	22	Among Makers and Dealers....	39
Readers' Clearing House.....	32	Recent Incorporations.....	39
The Accessory Corner.....	36	Brief Business Announcements.	40
From the Four Winds.....	38	Motor Car Repair Shop.....	42

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"The Plain English of Motor Car Insurance," which will be a feature article in the next issue of Motor Age, will explain to owners the ins and outs of the policies which protect them against fire, theft and accident.

*Spring Over-hauling Time
Is Accessory
Installing Time*

At no season of the year do motorists consider accessories more attentively than in the spring.

Between now and the middle of May, some 2,000,000 cars in this United States are due for a good overhauling.

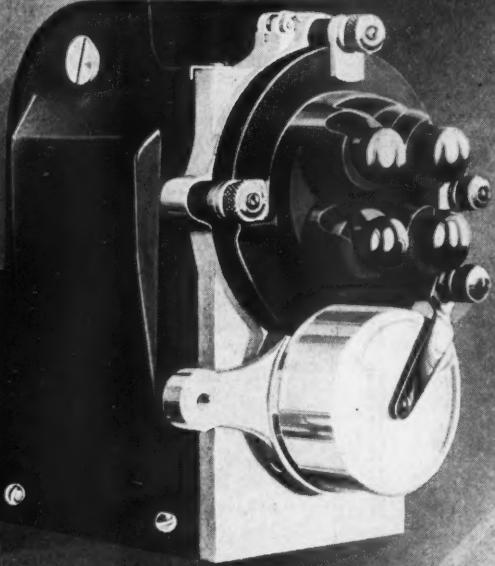
Overhauling time is the logical time for equipping these 2,000,000 cars with new accessories—with electric lights, self starters, power pumps, warning signals, automatic gear shifts, shock absorbers, piston rings, carburetors, magneto's, spring lubricating devices, and other accoutrement. By fitting out their cars in the spring, motorists get the use of new equipment throughout the entire motor season. "Two birds are killed with one stone"—the car thoroughly overhauled, and the latest accessories installed—all on one trip to the garage.

For the reasons above, accessory manufacturers will find *right now* a peculiarly advantageous time to push their advertising *hard*. Sometimes the slightest suggestion is all that is necessary to swing motorists "on the fence" over to *their* product. A volley of publicity at this time will puncture a lot of pocketbooks.

RATE CARD ON REQUEST

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910 So. Michigan Ave.
Chicago, Ill.

DIXIE 20TH CENTURY MAGNETO



Easy-Selling Cars

are what dealers strive after. In handling automobiles equipped with magneto ignition they are following the line of least resistance.

The wise men know that the magneto is the most efficient ignition equipment — timer distributor and battery equipment has the sole merit of cheapness.

An automobile without magneto ignition is inefficient in that its real power possibilities are never realized by the owner.

Far easier to sell an efficient car than one that is cheaply equipped.

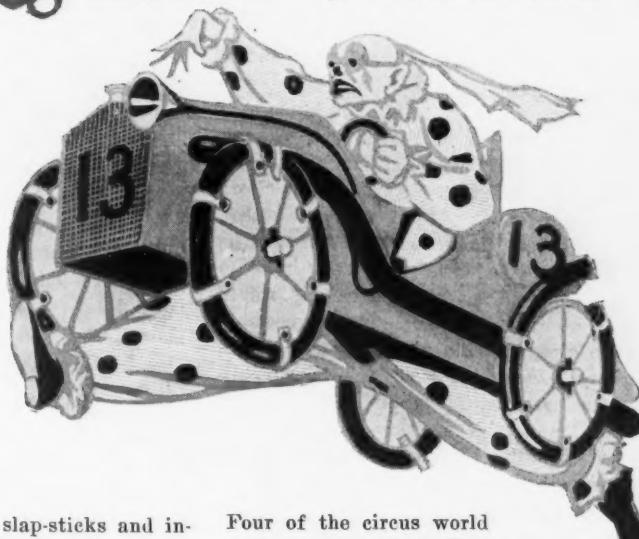
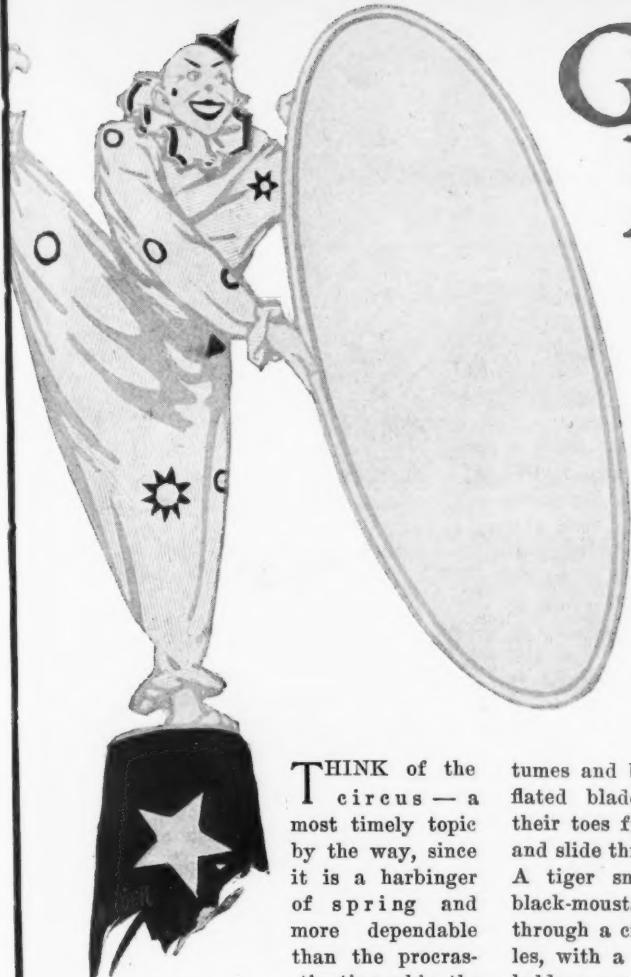


Splitdorf Electrical Co.
NEWARK, N. J.

(All SPLITDORF features are fully covered by patent or patents pending)

MOTORAGE

Gasoline on the Big Lot *by J.C. Burton*



THINK of the circus — a most timely topic by the way, since it is a harbinger of spring and more dependable than the procrastinating robin, the annoying notes of

the Italian's hurdy-gurdy or the first box score from the training camp of the Giants or Athletics—and through the mind a procession of horses gallop, elephants sway as they walk with ponderous, cautious step and red and gold wagons roll by to the accompaniment of blaring bands, roaring lions and chattering monkeys.

Reflect only for a moment, and on the billboards of your imagination you see the sixteen - sheet lithographs, flaming with color, fascinating with alliteration, boastful with superlative adjectives. A winking hiatus, and a great tent of spreading canvas is pitched in one corner of your cerebrum. Within are rings of sawdust and two elevated stages. A dainty equestrienne, in blue tights and ballet skirt, leaps from the broad back of a white horse through a paper hoop. Painted clowns race past, dressed in grotesque cos-

tumes and brandishing slap-sticks and inflated bladders. Performers dangle by their toes from the bars of lofty trapezes and slide through the air on swaying wires. A tiger snarls, shows his teeth to its black-moustached trainer and jumps through a circle of fire. A modern Hercules, with a leopard skin around his loins, holds a pyramid of men upon his broad shoulders. A herd of pachyderms march around the ring, keeping time to the music with their swinging trunks. Chariots rumble through the choking dust of the hippodrome. That is the circus you know.

Gasoline Age of the Circus

But in thinking of the "greatest show on earth," do visions of motor trucks and gasoline-propelled tractors flit through your mind? Rarely, I wager, yet they are important requisites of every modern circus, as important as the beasts of the menagerie—"the educational zoological exhibits from pampa, prairie and plain"—and the lithe-limbed performers, "gathered at enormous expense from the four corners of the globe." For the oldest of our amusements, which had its birth during the reign of the Cæsars and its revival in the medieval age of mountebanks and Punch and Judy showmen, has reached the gasoline epoch in its development and the Big

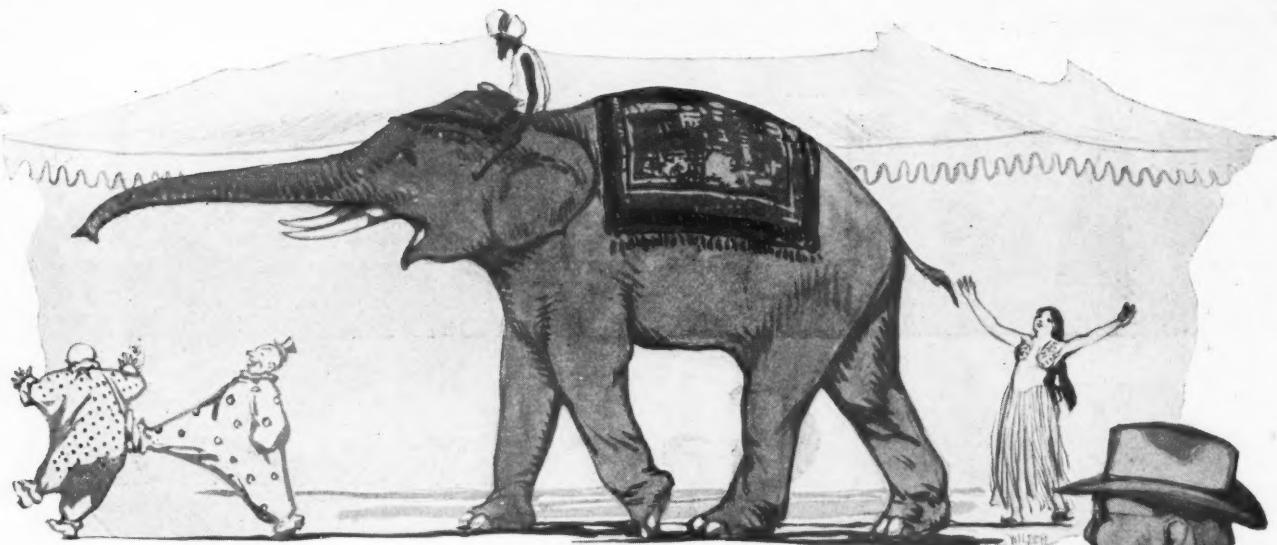
Four of the circus world—the owners of the Barnum & Bailey, Hagenbach-Wallace, Ringling Bros. and Sells-Floto & Buffalo Bill (himself) shows—are adding their mite to the dividends of the Standard Oil Co. and assisting in making John D. Rockefeller's wholesale philanthropies possible.

It sounds incredulous, almost sacrilegious, but it is true nevertheless. Had a prophet of 20 years ago told Phineas Taylor Barnum that within the next two decades gasoline would threaten to replace horses as the motive power of a circus, the pioneer of America's showmen would have laughed sardonically and declared:

"Perhaps the day is coming when mermaids will patronize corn doctors and the county Mayo will produce peaceful Irishmen, but horses will haul the wagons to the big lot until the end of time."

Yet the prophet would have been right and Barnum wrong, which only is further proof that seers never are honored in their own country.

The supremacy of the circus horse, a supremacy that bridges half a century or more, now is seriously challenged by the motor and the day is not far distant when the descendant of Ephippus will be



The motor car has brought the man with the hoe several hours nearer the elephant, the clown and the oriental dancer

superseded almost entirely as an agent of transport with the tent show by all-conquering gasoline. Not that the horse ever will be barred from the city of canvas. The horse is the circus, as much of a personification of it as the elephant, the clown and the bareback rider. Without horses, the "greatest show on earth" would be like poker sans cards and chips and an alarm clock minus the alarm. It would not be a circus. The horse is indispensable in the street parade and the grand introductory pageant and as a performer in the sawdust ring, but eliminate these three features and all the circus horses in captivity could be turned out to permanent pasture without serious consequences.

Horses' Labor to Be Lighter

"I believe that the time will come when motor tractors will handle most of the hauling of the circus, traveling from the trains to the lots with long strings of wagons trailing behind," Bill Curtis, master mechanic extraordinary with the Sells-Floto & Buffalo Bill (himself) shows, writes. "In the coming years, the horses of the show will pull only the first loads to the lot and then prepare for the parade, while the tractors do the rest of the work."

To understand the why and wherefore of this gasoline-with-the-tent-show! paradox, to understand how it was possible for the motor car to invade a domain where the horse seemed to be absolute, one must know the other side of the circus. You must gaze upon the tent show shorn of its tinsel and glamor. You must look at it through the wondering eyes of the small town boy, the little barefooted chap who, after a sleepless night of suspense and anticipation, races down to the railroad yard before the break of dawn to see the circus come in and at midnight watches the

heavy, canvas-covered wagons lumber away and vanish in the darkness, like a glorious dream that turns into a nightmare of regret.

Somber Side of the Circus

The circus is something more than a pageant, a show to thrill and amuse. Between the hours of 10 and 12 in the morning, 2 and 5 in the afternoon and 8 and 11 in the evening, it is a wonderful spectacle. At all other times, it is grim, exacting, sweat-producing, muscle-straining work. For the circus is a shifting city of tents that is built each morning at sunrise and torn down each night at midnight—a never-ending labor of Sisyphus; it is a community of 1,000 or more roving men and women, more restless than the nomad gypsies. The circus is a system raised to the nth power of efficiency. It is a moving, time-saving organization that rivals the death-dealing mechanism of the kaiser, the German army. In fact, the Teuton war lords learned how to feed their soldiers on the march by following the Barnum & Bailey show on its travels through Europe.

"There is one thing in the circus busi-



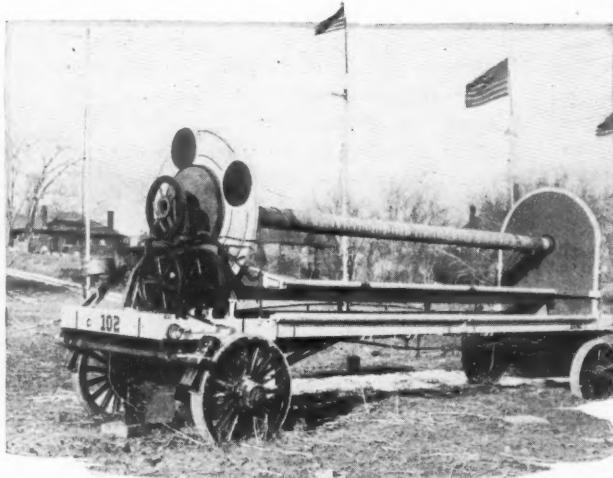
ness that is worth more than anything else," a veteran showman told me, "worth more than the billing, worth more than the name, worth more than the circus itself when you come right down to the last analysis and study the matter from every angle. That one thing is time.

Tent Show Must Save Seconds

"Did you ever stop to figure it out? Did you ever stop to think what good all the billing would be, what good the advance work would be, what good the executive staff would be—or any other unit of the circus would be—if the show did

not get from town to town in time to make the stands, if parades were lost day after day, if performances were blown, to use circus parlance, and if dates could not be kept? It would be the death of the circus. That is why the saving of time is the most important thing about a tent show."

When time is very precious, when highest efficiency is demanded, the lamp is rubbed and the genii of rapid transit, the gasoline engine, responds. Although a roving thing, the circus is just as progressive an organization as the manufacturing plant, the mercantile establishment and the other more stable and less romantic institutions



The tent raiser and canvas roller that does the work of forty men with the Sells-Floto show

that have found in the motor car and the motor truck an all-satisfying solution to their baffling twentieth-century transportation problems. If you doubt such a statement, look in the ticket wagon—a steel vault on wheels with combination lock on its door—and there you will see the adding machine on which the day's receipts are totalled and the money counter in the hopper of which bushels of silver coins are dropped to be separated, counted and rolled into packages automatically. Because the circus is progressive, because it had to meet exacting modern conditions, the traveling showmen revolutionized their methods of transport and mechanics by adopting the gasoline motor and adapting it to their special needs.

Circus Revolutionized by Gasoline

This is the age of the motorized tent show and with the coming of the gasoline engine, the life, the methods, the prospects of the circus have been changed entirely. Gasoline has swelled the daily receipts of the ticket wagon; increased the radius of the territory from which to draw crowds on a single stand from 20 to 50 miles; made possible the erection of the tented city in 1 hour after the first section of the belated circus train creaks into the railroad yards; saved time, money and labor. The head canvasman formerly

rode on horseback. He now directs the work of raising the tents from the seat of a roadster. The boss hostler, the man in charge of 800 heavy draft horses and 100 head of ring stock, rides to and from the lot in a motor car. The circus manager now employs a chauffeur, not a driver. At the close of the afternoon performance, the treasurer races with Old-fieldian speed in a gasoline-propelled vehicle to the local bank where thousands of dollars in currency are exchanged for cashier's checks. Gasoline engines wash the dishes and the table linen.

"I don't know what we ever did without 'em," is the eulogy of one veteran showman in speaking of motor cars. And he added: "Wouldn't they have been darbs, boy, in the day of the old wagon shows?"

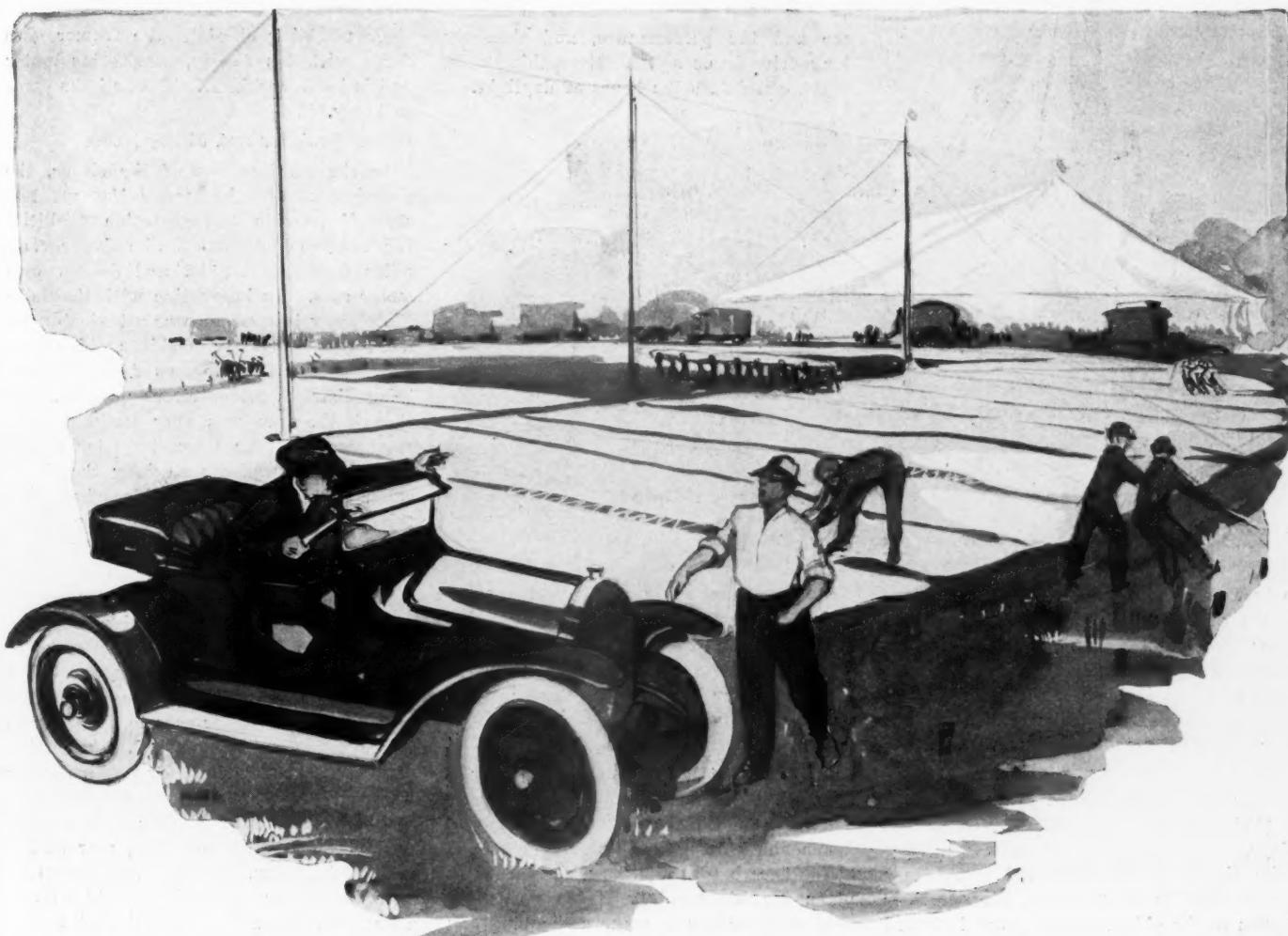
The circus thrives on the half-dollars of the farmers and the tent show of today is getting more nourishment from the rural communities than ever before in the history of spreading canvas and leather-lunged barkers. The motor car has made this possible. It has brought the man with the hoe many hours closer to the elephant, the clown and the oriental dancer.

In the days when the Duryea brothers, Elwood Haynes and Henry Ford were experimenting with the horseless carriage

and during the infancy of the motor car, when the tonneau buttoned up the back, the circus, on each stand, served a territory not more than 20 miles in extent. Twenty miles was the maximum distance that the average farmer cared to travel behind his plodding team or in the stuffy coach of an excursion train in order to gaze upon the hippopotamus and listen to the honeyed words of the side show ballyhoo. Then came the back to the soil movement of the motor car, which, like the Latin poet, Horace, sought the tranquility of the agricultural communities. Immediately, the routes of the tent show were changed. Longer jumps between towns and cities were now possible and the area served on each stand was increased to 50 miles, for the rural motorist thought nothing of a drive of two score and 10 miles to the canvas city of sawdust and spangles.

Farmer Goes to Night Show

"Look upon the record books of any circus, large or small, and they will show that up until about 6 years ago it was the afternoon performance that sent the creaking flat cars jerking along on their 20-mile an hour journeys," writes Courtney Riley Cooper, former press agent with the Sells-Floto & Buffalo Bill (himself) show. "It was the afternoon performance



The boss canvasman formerly rode on horseback. He now directs the work of raising the tent from the seat of a roadster

that paid the salary of the lion tamer and bought the hay which fed the 'blood-sweating behemoth' and his associates of the menagerie, which supplied the cook tent and filled the pay envelopes of the ticket wagon. But then something happened.

"Follow the years and you will find that it is now the night performance that does all these things. For

car. No longer does he go to the afternoon performance. He steps up to the ticket wagon at night when the glaring lights add more romance to the circus. When

the show is over, when the last thrills are gone, when the racers have rocked about the hippodrome in



The old way and the new of driving stakes. A pneumatic stake-driver has replaced five crews of nine men each with the motorized circus

see and the performance, and then the long drive home again. Everything must be crammed into the hours of daylight.

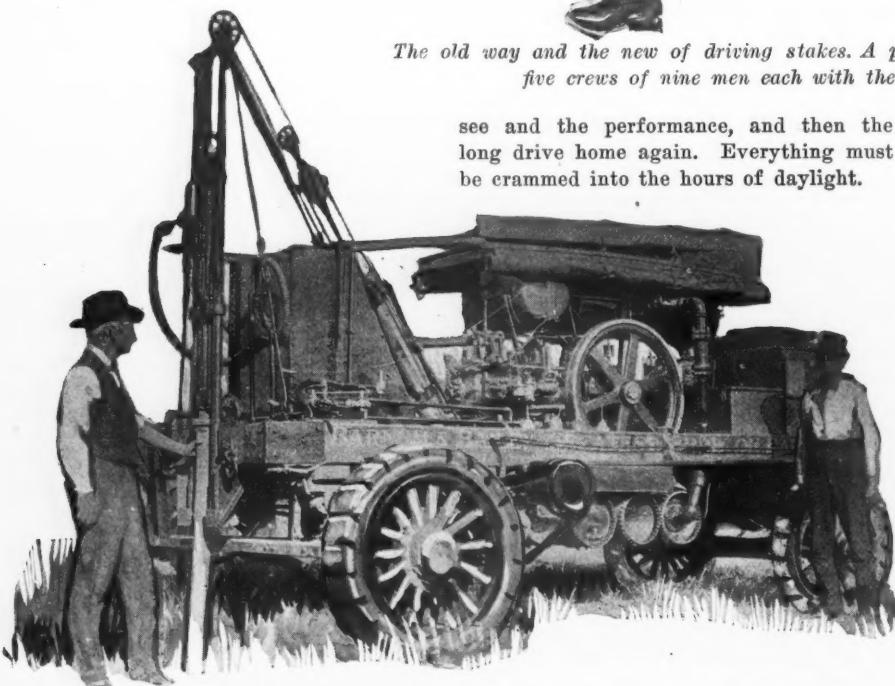
their rumbling chariots, the farmer goes forth with his family, cranks his motor and is home within a half hour if he cares to hurry."

Circus Taxicabs and Jitney Buses

In the gasoline age of the circus, the proprietors of the "world's greatest shows" provide transportation facilities for hundreds of patrons who live several miles from the big lot and do not own motor cars. An innovation with the Sells-Floto show last season was a taxicab service, a fleet of twenty machines which were used for carrying persons from the outlying districts to the circus grounds. Although the fare was very moderate, the machines paid for themselves during the summer and swelled materially the ticket sales. Jitney buses, capable of seating thirty passengers and manned by circus employes, will be a feature with at least two of the big shows this year.

The modern circus also provides accommodations for thousands of its perennial patrons who formerly tied their teams to the town square hitching rack or stabled their horses at the livery barn but who now drive their motor cars to the grounds where the tents are pitched. A portion of every lot is roped off for parking space where uniformed attendants are stationed to guard the machines while their owners feed peanuts to the monkeys, roar at the antics of Slivers, the clown, and gasp as an agile athlete from Nippon slides down a slack wire from the top of the tall center pole.

With the traveling show of today there



where there were once empty seats in the glare of the gasoline chandeliers, there now are jammed ones. Where there was a slackness of attendance after the shadows of night had come, there is now the biggest business of the day. Afternoon has changed places with night and the reason is the motor car.

Motor Car Affords Rapid Transport

"The explanation is simple. In the old days, when the circus came to town, those who lived in the surrounding territory arose early in the morning, hitched their teams to the old farm wagons and started to town with the dawn. There was shopping to be done, there was the parade to

"There was no possibility of staying for the night show. That would mean that the farmhouse, perhaps 15 miles away, would not be reached until far in the early hours of the morning. But it's far different today, when the majority of the farmers are wearing goggles.

"At the present time, the motor car is as much of an attribute to the farmer's business as the reaper or the mower. When the glaring announcements of the circus flare before him, he makes different plans for his holiday. It is no longer necessary for him to make a shopping day of circus day, for he can run into town almost any time he chooses with his motor

is a garage under canvas as well as a blacksmith shop. Here the farmer can have a broken spring mended or a faulty carburetor adjusted should these and other repairs to his car be necessary in order for him to drive home. The members of the repair crew of the 1915 circus are graduates of a new school. They must know how to correct ignition troubles and decarbonize engines. There is a different tone to the advertisements for circus help inserted by the master mechanic in the Clipper and Billboard. They once read: "Wanted: A No. 1 blacksmith. They have been changed to "Wanted: First class motor car repairman."

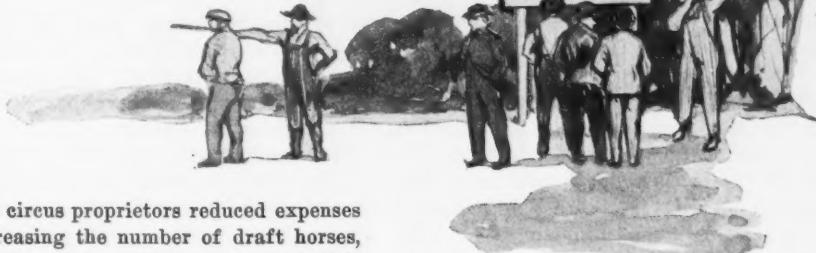
Yes, the motor car has revolutionized the circus.

End of the Elephant's Labors

On the muddy lot, where the wheels of heavy wagons sink up to their hubs in the mire, where the struggling horses sweat and strain without budging the load, where the "skinner," or driver, shouts and swears to no avail, the gigantic tractors and trucks have more than proved their efficiency. Their tireless engines throb defiance to the drenching rain. Their wheels

roll through the wallows when the black skies spit lightning and rolled with thunder. His great bulk and strength were required no longer in the emergency. Gasoline was more powerful than he. The elephant, once a humble workman, joined the ranks of the petted performers.

With trucks carrying double and triple the loads that horses were able to haul and tractors pulling strings of six and eight wagons from the railroad yard to the big



The show with the pneumatic stake-driver is less dependent on its canvasmen who are tempted to desert the show and work in the wheat fields

lot, the circus proprietors reduced expenses by decreasing the number of draft horses, or baggage stock as they are termed. This meant the saving of thousands of dollars a season, money spent for the purchase of the animals and for their feed and shoeing. It also resulted in the saving of many precious hours, for motors will travel at least 3 miles while horses are



If the big top is wet, the water is wrung out as the canvas is wound around the colossal spool

plough through the soft, spongy earth. Under such conditions, gasoline makes good where eight, twelve and sixteen-horse hitches fail.

When motor tractors were added to the equipment of the circus, the "ponderous, pea-eyed, palm-eared pachyderm" trumpeted with glee and settled down to a life of indolence and ease such as became a monarch of the jungle. His days of labor on the muddy lot were over. No more would he be called upon to push the wag-

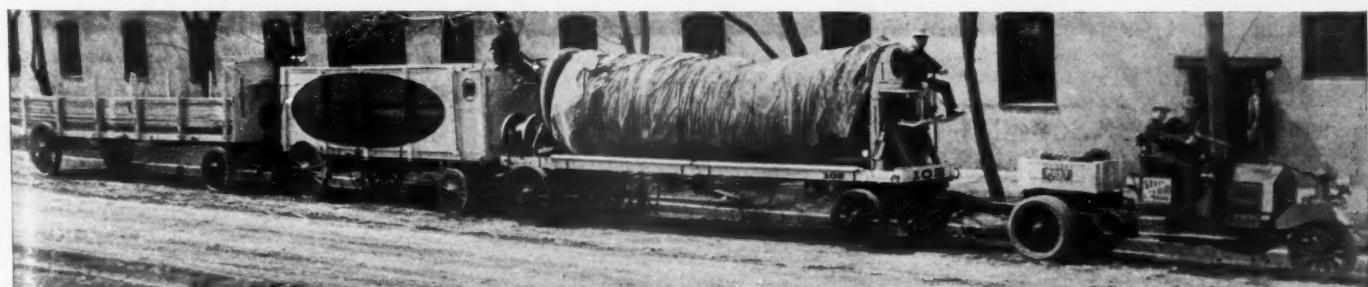
covering 1 as they labor in the sun.

Ingenious indeed are the methods by which the master mechanic of the "greatest show on earth" has adapted the gasoline motor to his varied requirements in order to save time and labor. There are the pneumatic stake-driver, the combined tent-raiser and canvas-roller, the pull-up engine and the lighting plant—modern devices of the modern circus and all dependent upon the fluid that made John D. famous.

In order to build a city of canvas, between 1,000 and 1,500 stakes must be driven each morning. At night, when the Arab of all amusements folds its tents and moves away, these stakes must be pulled up and loaded in wagons. Up until 3 years ago, this work was done by forty-five men, divided into five crews of eight men each and a boss. Swinging their heavy sledges in perfect unison and never missing a blow, they played a symphony of motion and force upon the blue, iron-banded stakes. Their time put to shame the even tempo of the Thomas orchestra, with Frederick Stock waving the baton. These gangs worked from early morn until parade time in the monotonous labor of driving stakes, worked and sweated in the blazing sun of the scorching forenoon that the doors of the big tent might be opened at 1 o'clock for the afternoon performance.

Lost Chord of the Circus

But the symphony played by the sledging gangs is one of the lost chords of the circus. The stakes no longer are driven by hand. Gasoline has taken the place of muscle on the big lot and the pneumatic stake-driver is doing the work of forty-five men at a saving of from 3 to 5 hours



The motor truck finds a new use in hauling circus wagons. A Knox 60-horsepower motor tractor, hooked up to three big baggage wagons of the Sells-Floto circus weighing 35 tons, can haul them at a rate of 12 miles an hour over a good road, thus doing the work of thirty-two horses.

daily in time, time that is valued at \$1,000 an hour by the owners of the tent show. The pneumatic stake-driver is a miniature pile-driver, deriving its power from gasoline and not from the force of its own gravity. It is the invention of Charles Andress, of Chicago, an executive with the Ringling Bros. and Barnum & Bailey shows for 25 years, and used by the latter circus for the past 3 seasons.

The circus that has a pneumatic stake-driver in its equipment can be several hours late at a stand without being forced to abandon a performance. The train that pulls into the railroad yards at 12 o'clock can be unloaded and the tents raised by 1 o'clock, the scheduled time for the opening of the doors for the afternoon show. Working at high speed, the stake-driver can drive 800 stakes an hour. No five sledging gangs could accomplish the same feat in thrice the amount of time.

Boss Canvasman Should Worry

The pneumatic stake-driver, moreover, has smoothed the lines of worry from the brow of the boss canvasman. When the show is traveling through the wheat belt at the height of the harvest season, his sleep is disturbed no longer by hideous dreams of undriven stakes and unpitched tents caused by the desertion of his hirelings who have left the show and a dollar a day job to earn five and ten times as much in the golden fields of Kansas and the Dakotas. The Andress invention has made the boss canvasman less dependent on his razorbacks, those picturesque soldiers of fortune who, though members of the circus, never wear the spangles of the profession or see their names on the billboards; a legion of loyal workmen who suffer fatigue, discomfort and pain and go without sleep, who labor in the drenching rain and wilting sun in order to worship at the gilded shrine of the thing they love—the circus.

Mighty is gasoline on the big lot! Not only does it drive the stakes but it raises the tent poles and the 2½ acres of canvas that is carried by the modern circus, thus saving time, labor and money. The vehicle used for this work is a long truck on which is mounted a monster spindle or spool, operated through gears by a gasoline motor. It does the work of forty men at much greater speed and with less exertion.

When the canvas and pole wagons reach the lot and the boss canvasman has designated the site of the various tents by sticking small red flags in the ground, the tent raiser is wheeled into action. The long poles are laid in their place and ropes are attached to the spindle. The gasoline engine is started. The spool revolves and

in less time than it takes to write it, the skeleton of the tent is raised. Five poles, around which two score razorbacks once pulled and strained, travel upwards at once.

With the poles in place, the big top, the tent under which the performance is given and measuring 380 feet in length and 180 feet in width, is laid upon the ground and ropes are attached to the spindle once more. Again the engine puffs and snorts. The workmen of the circus stand by and watch. There is no need of their muscle. The tent is hoisted to its position without a tax of 1 ounce upon their energy. The great expanse of canvas is spread with the same ease as a yachtsman breaks out a spinnaker before running with the wind.

At night, when the high-salaried performers are asleep in their berths and the workmen are tearing down the city of canvas in the glare of gasoline torches, the tent-raiser performs another labor of Hercules for the traveling showman. The gasoline engine that raised the poles lowers them. On the monster spindle is rolled the canvas under which thousands had been thrilled. If rain has fallen through the day and the big top is wet, the water is wrung out as the tent is wound around the colossal spool. Water rots canvas. At midnight, when every second is worth hundreds of dollars and the next town is 100 or more miles away, the showman cannot wait for the morning sun to dry out his tent. He must load canvas, plus water, on the flat cars and make the jump regardless of consequences. Thus, the combined tent-raiser and canvas-roller not only saves time and labor but canvas as well.

Loading Canvas in 30 Seconds

Instead of loading the canvas one section at a time as formerly, two pieces now are loaded at once. This saves the work of lacing and unlacing half the canvas. In the wettest weather, three men, operating the roller, can wind sections, 50 to 180 feet in size, in 30 seconds. The Sells-Floto show carries two gasoline-driven drums which have a capacity of 95,000 square feet of canvas.

By the use of the tent-raiser and roller, the life of canvas is prolonged. When the final day of the season comes, when the clown puts on his white paint for the last time and the big top is ready to be shipped to the shed where it will be stored for the winter, the canvas looks as good as it did the spring before.

Before the gasoline age of the tent show, horses, known as pull-up teams in the patois of the sawdust ring, were employed to load the heavy wagons on the flat cars

of the long circus train, a train of as many as eighty-six cars and divided into four or five sections. Although strong, powerful animals and the most costly of all the baggage stock, the horses suffered under the daily strain of dragging the 1 and 2-ton wagons up the runs, or inclines, and along the flat cars. The majority of the pulls were long pulls as the average section measures at least ¼ mile in length. Consequently, the pull-up teams rarely lasted more than one season and the owner had to sell them at a great sacrifice each year before going into winter quarters.

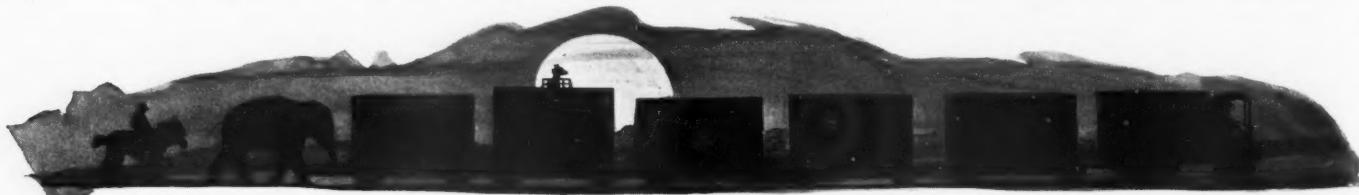
Saving Horses and Hours

With the circus motorized, however, the pull-up team is being gradually replaced by the gasoline engine of the donkey type which operates a windlass and cable. By the substitution of this mechanism, valuable baggage stock is being saved and the work of loading the trains is being performed in less than half the time consumed when the showman depended entirely on equine power.

As a result of the adoption of improved lighting systems that employ gasoline motors to generate power, the twentieth-century showman is illuminating the tent at night with 10 gallons of gasoline instead of 300 gallons as formerly when torches such as the patent medicine faker hangs on his wagon were used. The circus owner of 1915 is burning compressed air, which is forced from gasoline retort tanks through hollow wires to the lamps, or illuminating with electricity. With the shows and carnival companies using electricity, the power plant is mounted on a motor truck.

With the circus of today, the steam calliope is both steamless and fireless. No longer is the red and gold vehicle of Pan a thing of spurting steam and choking smoke. The calliope stoker has shed his last drop of sweat and shoveled the last hundred-weight of coal into the sizzling fire box in order to have music float in the wake of the circus parade. The steam calliope has undergone a revolutionary change. Compressed air has replaced steam and a gasoline motor does the work of the coal-consuming engine of our boyhood.

The steamless, fireless calliope has lightened the labors of the circus musicians, who once blew and tooted until their wind was spent but blew and tooted on regardless of aching lungs and numbed lips. The new type of calliope can be operated under canvas without danger of choking and blinding the spectators with its smoke. When the players on trombone, cornet and bass horns stop for breath, there is no dearth of music, for from the pipes of the calliope issue the latest ragtime notes.



New Yorkers Take Issue With Officials of City

Argue Over Redrafting of Ordinances

NEW YORK, April 5—Once more the Automobile Dealers' Association of New York city and the municipal explosives commission have locked horns. The last time it was over the separator; this time it is over a whole set of ordinances.

The city proposes to codify and revise its ordinances, and the commission has had a hand in formulating those applying to dealers and garagemen. Hearings are being held by the general welfare committee of aldermen; one was held Monday, at which time the dealers succeeded in having all ordinances to which they have thus far taken exception and all which will be later proposed laid over to a hearing April 16 at 2 o'clock.

Attorney Charles Thaddeus Terry, for the dealers, gently dropped a bomb into the midst of the ordinance formulators Monday when he told them that according to the legal classification of the laws in question the license fees could not exceed the cost of examination and registration and that the fees should go toward administrative expense; at present they all go to the firemen's pension fund, which, Terry said, was contrary to law. This may necessitate the redrawing of all the ordinances, those which affect the motor car trade and all others.

Terry and President R. H. Johnston of the association demanded that the city lay down a building code by which a dealer or garageman could be guided with the assurance that compliance with its provisions would insure freedom from prosecution after the erection of the building. Exception was also taken giving the fire commissioner too much power.

MAYOR'S CUP FOR INTERCLUB RUN

Chicago, April 7—The municipal election yesterday resulted in the victory of William Hale Thompson for mayor, a result which is of interest to motorists because the mayor-elect has presented a trophy for the fall interclub team match which this year will bring together teams from the Chicago Automobile Club, the Chicago Athletic Association and the South Shore Country Club, promising to be the greatest reliability of the year. This trophy is to be called the mayor's cup and will go to the winning team. Frank X. Mudd of Chicago, chairman of the A. A. A. touring board, also has given a \$250 trophy to go to the team with the greatest number of perfect scores.

HOOSIERS STICK TO A. A. A.

New York, April 7—Attempts to influence the Indianapolis motor speedway to break away from the American Automobile Association apparently are meeting with little success, according to a bulletin issued today by the American

Automobile Association which quotes as follows from a director of the Indianapolis speedway, in which it is stated that the speedway stands firm for A. A. A. control. The director said:

"The Indianapolis speedway believes that the only sane way to control racing from the point of view of protecting the public is through the impartial sportsman-like administration of a disinterested body like the A. A. A. As long as the speedway endures we shall give our support to the A. A. A. and we hope the support never will fall into the control of various local organizations which will run things practically as they please."

TO FILM THE LINCOLN HIGHWAY

New York, April 5—Mayor Mitchel of New York will serve as official starter of the transcontinental trip over the Lincoln highway this month when officers of the Lincoln Highway Association, accompanied by motion picture men, will leave for San Francisco to take 7,000 feet of film which will show the features of the big trail from coast to coast. H. C. Ostermann, consul at large of the Lincoln Highway Association, will be in charge of the expedition. The trip will be made in a Stutz. The pictures will be shown first at the Panama-Pacific exposition.

BARS SMOKING ON JITNEYS

Rock Island, Ill., April 5—The jitney bus drivers of the Tri-Cities have adopted new rules, fixing 21 years as the minimum age for drivers and directing that intoxicating liquors be barred while on duty. Tobacco is also barred. Back talk to patrons is prohibited. Intoxicated persons must not be carried. Fares are restricted to 5 cents, except where patrons wish to go off the established route, when an additional nickel is charged. Strict observance of traffic rules is required.

The city authorities are investigating complaints that the jitney drivers, after carrying people all day for 5 cents, remove the flags and signs from their cars at night and charge what they can get. This has stimulated the movement for strict regulations and municipal control.

LIMA A NEW LIGHT CAR

New York, April 7—The Lima light car is about to be produced at the rate of ten a day as the maximum for the present by the Lima Light Car Co., Lima, O. It is a simple standard type chassis and will be made with three body styles, speedster, roadster and light delivery wagon. The price of the car is \$500. There is a unit power plant with a block four-cylinder valve-in-the-head motor, the motor being rated at 18 horsepower. Atwater Kent ignition is used. Three for-

ward speeds are provided and the clutch is a leather-faced cone. Both brakes are equalized and electric lighting is standard equipment. The wheelbase is 100 inches; tires 28 by 3. Officials of the company are: I. J. Miller, president; C. E. Miller, vice-president, and A. C. George, secretary-treasurer and general manager. It is announced that the experimental cars have been tried out.

TAKING TIME BY FORELOCK

Jacksonville, Ill., April 3—In order to head off any possible jitney competition, the Jacksonville street railway company has installed motor cars to operate from the terminus of the trolley line to Diamond Grove cemetery, accepting transfers from the street cars. The motor cars will operate hourly temporarily. Should the experiment prove successful, additional service will be installed to other points not reached by the street cars.

MILWAUKEE ADDING TO FLEET

Milwaukee, Wis., April 5—Milwaukee's jitney industry is in a thriving condition still, and getting better every day. On April 3 the total number of jitney licenses issued was 237 and the daily average issue is fifteen. Until May 1 the fee will be \$5, as for a half-year, and after that date the annual fee of \$10 will be charged, licenses being good until May 1, 1916. The licenses are the same as for any "for hire" vehicle and are not special grants for jitney buses.

About 150 jitney operators have organized as the Independent Jitney Association and chosen a business agent with downtown headquarters. The association proposes to settle the matter of insurance by mutual liability unless the insurance companies reduce their premium rates.

NEW LIST ON THREE BAKERS

Cleveland, O., April 6—The Baker Motor Vehicle Co. has reduced the price on three of its models, namely, the D. A. coupe, from \$2,800 to \$2,475; the double-drive brougham from \$3,250 to \$3,000; and the W. A. roadster from \$2,300 to \$2,000.

SCORCH AND LOSE YOUR CAR

Minneapolis, Minn., April 7—Every Minneapolis owner who violates the traffic or motor car laws from now on, will be deprived of the use of his car for a full year, according to an edict issued by Police Judge Smith. It is expected this will stop scorching.

STUDEBAKER BOARD RE-ELECTED

New York, April 7—at the annual meeting of Studebaker stockholders today the retiring board of directors were re-elected without opposition.



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Some Problems of the Jitney

NEVER has a new device, a new method of doing things or a new system of public service made its appearance that it has not met with a number of problems, previously unknown, but which had to be solved before the innovation could become a success. Stephenson had to find his rails before the locomotive could be successful; Edison must needs perfect his record cylinder before the phonograph was possible.



THUS, with the coming of the jitney bus, there has sprung up a number of individual problems, problems which heretofore had not presented themselves, but which must be solved if this type of transportation is to be either the public benefit or the financial success that it is hoped it will prove to be. It is upon the wisdom with which these problems are solved and upon the far-sightedness with which these solutions are applied to each individual city that the final failure or success of the movement as a whole must depend.



PROBABLY the most pressing of the problems which have presented themselves to the city fathers and to the jitneymen themselves in the municipalities where these conveyances have appeared in any numbers, is the need of controlling irresponsible drivers. With the laudable purpose of maintaining schedules and providing as rapid transit as possible, jitney drivers, it seems, are apt to overlook or neglect the safety first methods which are necessary in congested districts. Numbers of accidents to pedestrians have been reported, due to the overzealous ambitions of those at the wheels of the buses.

ONE of the larger cities in the east has sent its director of public safety on a tour through the west, investigating the jitney bus situation. Upon his return this investigator reports that jitneys are a nuisance from a public safety standpoint. While he recognizes the value to the community of the service they are doing, he recommends that stringent regulations be enforced, in order to minimize accidents. There is enough unjust legislation directed at the jitneys, and those in control of the bus lines should see to it that their cars are handled in a way to give just cause for none. Any lever by which the traction interests may secure discriminating legislation will not be overlooked.



A PROBLEM of the new motor transportation which is limited to the jitneymen themselves is the important one of insurance. In some respects it goes hand in hand with the safety problem. Rates of insurance for jitney buses are higher than they are for purely pleasure cars. Schedules of insurance rates restrict the application of their regular premiums to cars used for pleasure only. The carrying of passengers for hire throws the cars into the livery class on which the premiums are approximately 1 per cent greater for fire and theft than they are in the purely pleasure car class. This is not so important on the fire and theft policies, but in the personal liability and collision and property damage insurance, the rate is considerably advanced over that for purely pleasure cars. Inasmuch as the conditions of operation of the jitneys make such insurance almost a necessity, there is need of some concerted action toward clearing up the situation.

Skill in Race Driving

AMERICAN drivers who have been handling European racing cars possibly do not know their mounts is the explanation offered by Dario Resta for the poor showing made by these foreign cars in the hands of Yankee pilots as compared with their performance with Europeans at the wheel. At the recent luncheon to the winner of the Vanderbilt and the grand prize at the Chicago Automobile Club, Resta expressed surprise at having found that the tachometer—the instrument which tells the speed of the engine crankshaft at all times—had been removed from all of the European cars when they were raced by American drivers most of the latter seemed to think the instrument an unnecessary complication and a source of power loss.



IT was this fact, Resta said, which indicated the reason for the indifferent success obtained by American pilots with cars which were proven winners in the hands of drivers from across the water. Our drivers, according to the English-Italian speed merchant, are too averse to changing gears to get the best results from the European racing cars. High-speed motors, such as those in the Sunbeam and Peugeot cars, must be kept turning over at their proper speed all the time during a race and this requires frequent gear-changing, particularly on the turns.

A TACHOMETER, or crankshaft speed indicator, always is mounted on the dash of these cars where the driver can watch it, and is marked with the proper speed at which the crankshaft should be kept. The mere fact that the American drivers permitted the tachometer to be removed, Resta considers evidence that they did not appreciate the necessity of keeping the motor up to speed, without which success is impossible. In driving cars with these high-speed motors, much better speed can be obtained and much less strain on the engine obtained by shifting down on the turns to third and, in some cases, even to second and not shifting up until the car speed was sufficient to prevent the motor speed being pulled down by the added load thus imposed.



RESTA, himself, while he was at the wheel of the Peugeot during the Vanderbilt and grand prix races was in fourth or high gear only on the straightaways, shifting into third and, on one corner into second, when making the turns. He did not shift into high until the motor speed on the lower gear had gone up to the proper r. p. m. This shifting required not only accurate knowledge of just when it should be done, but a skill which can be acquired only by practice. Then it is so noiseless that spectators refuse to believe a shift was made.

Massachusetts Expects to Tag 95,000 Cars This Year

Outlook Is for \$1,000,000 in Registration Fees

BOSTON, Mass., April 3—Present indications point to the registering of at least 95,000 cars in Massachusetts during 1915, and the receiving of more than \$1,000,000 in registration fees from motorists, according to E. J. O'Hara, who has charge of the registration department of the Massachusetts highway commission.

For the first 3 months of 1915 more than 60 per cent of the total registrations for last year have been sent in, and close to \$700,000 have been received in fees. The gain over the first 3 months of last year is nearly 15,000 cars and \$170,000. There has been a big gain in the trucks, too. Last year for the first 3 months there were 5,200 commercial vehicles registered, while this year so far 7,800 are listed. As there were 8,236 trucks registered for all of 1914 it indicates that business is going to be good for that line, too.

As the tax collectors make their rounds on April 1 looking for property a lot of people who have bought cars stipulated that they should not be delivered until after that date, so as not to be included in last year's tax list, and to escape the coming year as much as possible. So from now on there will be another big rush at the registration department. It is not unusual now to see as many as 100 people in line at any time during the day getting registration numbers.

All motorcycles have to carry two numbers now, like motor cars, and that means there will be about 10,000 sets of plates for those. Under the law, just amended, any bicycle with the new motor wheel attachment comes under the registration law, and the operators also must take out a license this year. The following figures show how the registrations compare for all of 1914 and for the 3 months of this year with the 3 months of last year:

	Jan., Feb., Mar., 1914	Jan., Feb., Mar., 1915	Total 1914
* Motor vehicles	41,750	56,931	77,246
Commercial	5,200	7,800	8,236
Motorcycles	2,262	3,995	8,161
Mfrs. and Dealers	1,300	1,489	1,518
Licenses ...	3,355	5,826	26,858
Renewals ...	15,151	15,848	72,674
E x a m i n a tions ...	1,458	1,855	7,497
Receipts ...	\$512,183.04	\$682,524.05	\$925,964.75

* Total, including trucks

MUST CARRY TAGS

Louisville, Ky., April 5—Persons operating cars with "License Applied For" tags are liable to arrest and fines for violation of the state motor vehicle law, according to a letter addressed to City Attorney Beckley by Commissioner of Motor Vehicles T. S. Byars. The letter was referred to the board of public safety.

Commissioner Byars said that not only did the motor vehicle law make no provision for operating a car with a "License

Applied For" card, but that no excuse exists for the operation of cars without proper license tags, as the motor vehicle bureau supplies these tags simultaneously with the issuance of a license and that licenses are issued as soon as applied for.

SCHOLARS DEBATE OVER JITNEY

Rock Island, Ill., April 5—Now they are debating about the jitney bus. In the Rock Island High School last week two teams debated over the subject: "Should the jitney bus be abolished?" Both sides were well handled by the students. No decision was made by the judges. The subject was timely, as the jitneys are creating a vast amount of comment. While the ordinance for controlling the jitneys is being argued in the city councils, the tax payers also are arguing on the street corners. There is a strong demand for heavy bonds, not less than \$10,000 to indemnify any one who is injured. It is asserted that in most instances the driver of the car or

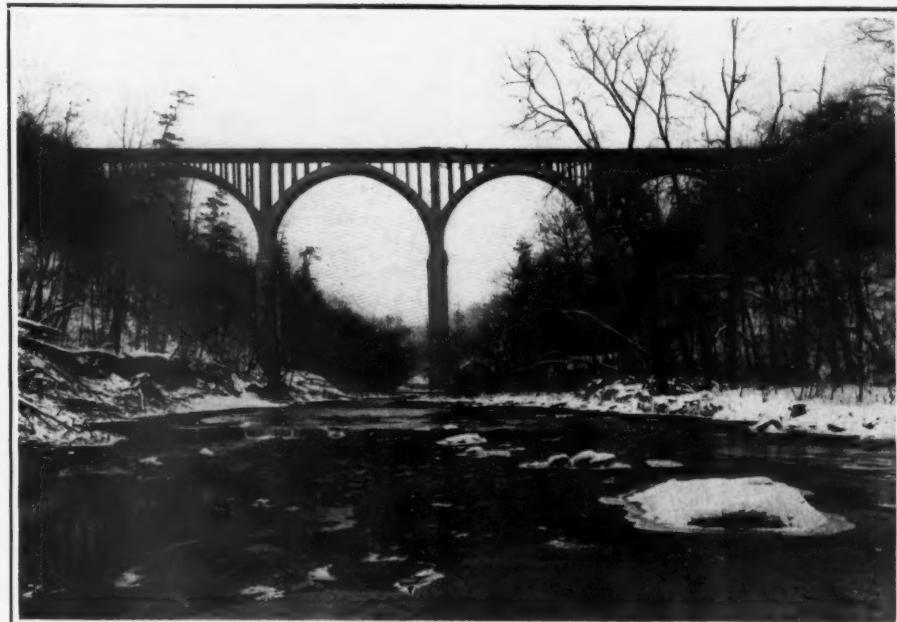
the owner has no means beyond the car and even that may have been bought on credit.

The question of tax also is a fertile subject. Cedar Rapids is charging \$75 per annum for five-passenger cars, and \$125 for the larger type. A bill was introduced in the Iowa senate this week which gives cities a right to regulate the jitney buses, fixing the streets upon which they may operate, etc.

PASSENGER TAKES RISK

Detroit, Mich., March 31—Judge Wiest, in the circuit court, in the case of Kate Figorski, administratrix for the estate of her deceased husband, against May Ritchie and the Detroit United Railway Co., held that a person which accepts an invitation to take a ride in a motor car assumes his share of any negligence of which the person which invited him may be guilty, and that no damage can therefore be collected.

See America First— • • • See America Now



EDITOR'S NOTE—This is the twenty-first of a series of illustrations and thumb-nail sketches of the scenic and historic wonders of America to be run in Motor Age for the purpose of calling the attention of motorists to the picturesque points of interest in their own country.

NO. 21—HIGH BRIDGE ACROSS THE CUYAHOGA RIVER, NEAR AKRON, O.

In driving on the state road between Akron, O., and Cleveland, motorists have an opportunity of crossing the highest concrete motoring bridge in the world. It spans the Cuyahoga river and is about 2 miles out of Akron. The bridge is 190 feet high and 782 feet in length and affords a spectacular crossing on one of the most scenic rides in the state of Ohio.

Tacoma Trying New Idea in Speedway Construction

Asphalt Surface to Be Laid Over Planks on Race Circuit

TACOMA, Wash., April 3—The Tacoma Speedway Association has adopted a new idea in track construction in that it has decided to plank its course and cover the timber with asphalt to reduce resistance to a minimum and secure an elasticity, which, it is claimed, is not found on dirt tracks. Work on this started March 23 and the contract calls for the speedway to be turned over to the association on June 1, which will be soon enough, for the first meet is not scheduled until July 4.

The planks are being laid on edge at a width of 50 feet for the entire 2-mile circuit. These planks have a space of $\frac{1}{2}$ inch between them, so that the present dish of the track will be retained. When the planking is done, these intersections will be filled with small gravel, after which the track will be cleaned off and the entire surface given a thin coating of asphaltum oil and sand. This treatment, it is claimed, will prevent skidding even in wet weather and still will not slow the cars.

There are four curves on the course, all of which are of the same radius—819 feet—and all of which are banked on the outside to the height of 18 feet, and in place of being banked on a straight line, there is a dish of about 2 feet from top to bottom of each curve, in order to keep a car from leaving the track.

BURMAN WINS MATCH RACE

Los Angeles, Cal., April 4—Special telegram—Driving his rebuilt Peugeot, Bob Burman easily defeated Disbrow in a Simplex and Earl Cooper in a Stutz in the three-cornered 50-mile match race at Ascot Park today. Cooper finished a poor second, almost two laps behind Burman. Disbrow broke a drive chain on his twenty-first lap, losing three laps. Again on his thirty-fifth lap he broke another chain and retired.

Burman's time for the half-century was 52:36.9 and Cooper's 53:46.45. The poor condition of the track was responsible for the slow time. Cooper began to lose from the start and at the end of ten laps was $\frac{1}{2}$ mile in the rear. On the seventeenth Burman lapped him and on the twentieth Disbrow passed him but broke down the next time around.

DELAGE FOR JOHN DE PALMA

Indianapolis, Ind., April 5—John de Palma, a brother of the road racing champion, will have a mount in the 500-mile race on the local speedway. Upon him will devolve the task of piloting the Delage, which won the 1914 sweepstakes with René Thomas at the wheel. John de Palma has been selected by W. E. Wilson, who now owns the Delage, to represent him and the entry was filed today. New-



PLANKING TACOMA SPEEDWAY PREPARATORY TO ASPHALTING IT

house has driven the Delage for Wilson in several of the coast events, but without much success.

OKLAHOMA CITY NEXT ON CARD

Oklahoma City, April 3—The next racing event of importance is the meet in this city on April 20-22, which has attracted such stars as Burman in the Peugeot; Oldfield in the Maxwell; Cooper and Wilcox in Stutzes; Disbrow in the Simplex, and Hearne in the Case. On the first day there will be a 150-mile motorcycle race and a 99-mile motor car race for Oklahoma drivers. The free-for-all, a 200-mile event for a \$5,000 purse, is booked for April 22.

The 2.4-mile circuit is all asphalt save for a $\frac{1}{4}$ -mile stretch, which is dirt. The turn, however, is 50 feet wide and with a 10 per cent bank. There also are two asphalt straightaways, each about a mile in length.

COLORADOANS PLAN TOUR

Colorado Springs, Colo., April 3—A unique "See America" expedition will visit the states of the middle west in April. The trip will be made by motor car and will cover an itinerary of about 3,000 miles. Starting from Colorado Springs and Manitou, the tourists, who will be representative Colorado business and professional men, will travel directly eastward over the Pike's Peak Ocean-to-Ocean highway as far as Indianapolis and possibly Columbus. The return will be over a circuitous route, visiting Chicago, St. Louis, Kansas City and other points. The tentative itinerary is as follows:

COLORADO—April 14—Via Pike's Peak Ocean-to-Ocean highway, through Colorado Springs and Manitou, Calhan, Ramah, Simla, Limon, Arriba, Flagler, Stratton and Burlington.

KANSAS—April 14-17—Via Pike's Peak Ocean-to-Ocean highway, through Goodland, Colby, Norton, Phillipsburg, Smith Center, Mankato, Belleville, Washington, Marysville, Seneca, Hiawatha and Troy.

MISSOURI—April 17-19—Via Pike's Peak Ocean-to-Ocean highway, through St. Joseph, Stewartsville, Cameron, Hamilton, Breckinridge, Chillicothe, Brookfield, Bucklin, Macon, Clarence, Shelbina, Monroe City and Hannibal.

ILLINOIS—April 20-22—Via Pike's Peak Ocean-to-Ocean highway, through Bayliss, Griggsville, Jacksonville, Springfield, Decatur, Tuscola, Hume and Chrisman.

INDIANA—April 22-24—Via Pike's Peak Ocean-to-Ocean highway, through Rockville, Danville, Indianapolis, Greenfield, Cambridge City and Richmond.

OHIO—April 24-26—Route not definitely selected—Cincinnati, Dayton, Springfield and Columbus.

INDIANA—April 27-29—Route not definitely selected.

ILLINOIS—April 27-29—Lincoln highway probably, Chicago.

IOWA—April 29-30—Route not positively selected—Clinton, Davenport, Moline, Ill.; Rock Island, Ill.; Burlington-Keokuk-Quincy, Ill.

MISSOURI—May 1-5—Route not definitely selected—Palmyra, Hannibal, St. Louis, Kansas City.

KANSAS AND COLORADO—May 5-8—Return to Colorado Springs via Santa Fe trail, Golden Belt road, Red Line or Kansas White Way; to be decided later.

CROSS-COUNTRY RACE ENDS

San Diego, Cal., March 31—The interest of the visitors to the Panama-California exposition centered on Miss Margaret Gale today, when she drove out of the exposition grounds on her way up the coast, completing the first transcontinental tour of the 1915 season. Secretary of the Interior Lane, the guest of honor at the San Diego Exposition, had a close rival in the interests of the fair visitors last Saturday, when Miss Gale drove into the exposition in the Stutz roadster, which was the first to cross the continent to the California expositions. Accompanied by Raoul Le Mat, Miss Gale made the long trip. The car competing against the Stutz in the first transcontinental race is a National owned and driven by James Boernstein, of New York. Accompanied by his brother, Boernstein arrived in San Diego with his National but a few hours after the Stutz.

Bay State Solons Prove Sane on Motor Legislation

Many Absurd Measures Killed in Committee

BOSTON, Mass., April 3—As far as motorists are concerned this year the Massachusetts legislature has made a new record, that of practically letting the industry alone. Out of all the bills presented, numbering close to thirty, only a few have been reported out of the committee, and these did not amount to very much. Some were favorable to motorists. The roads and bridges committee had the greater part, as it does every year. This year the Bay state had the best committee that ever handled motor legislation, for there were no delays, and everyone got fair consideration. But the freaks were quickly eliminated. There were no clashes among the motor organizations this year. At the beginning of the session the Bay State A. A. legislative committee secured a meeting of other organizations and discussed the different bills, so that uniform action might be had. Everything went all right except for a somewhat uncalled for slap at the committee in a circular issued by the Massachusetts State A. A. on the speed bill.

There were a number of bills on head-

lights calling for dimming them in various ways in different sections. The motor organizations suggested that the whole matter be turned over to the highway commission for consideration. So the committee reported a resolve that the commission take the matter up for investigation and report to the legislature next January.

There were bills to make motor cars stop 8 feet from a street car; to require all owners to carry a liability of \$3,000; to use some of the money from motor car fees to pay for guides for blind people; that number plates should be sent by parcel post; that chauffeurs be examined as to their eyesight; to change the law for registering operators; to regulate the sale of second-hand cars; to require a different truck registration; to have all cars used for hire take out a \$3,000 insurance; to change the speed limit.

These were all heard by the committee on roads and bridges. They were all thrown out except a speed bill. This was to change the law from the reasonable and proper definition at present to one calling

for a flat 25-mile an hour speed. When it was argued some of the motorists said that if any change were made that the least it should be was 30 miles. The committee reported a 30-mile bill, but made no great effort to have it passed. It was killed in the senate.

Senator John W. Haigis, who was chairman of the committee, has been thanked by the Bay State A. A., and asked to extend his thanks to the committee for the organization for its fairness to the motor industry. Of the eleven members of the committee only one had served on it before, so it was practically a new one.

The joint judiciary committee had a bill to place chauffeurs under the workmen's compensation law, but it turned it down. The social welfare committee reported a bill to allow prisoners to work on the state highways. The mercantile affairs committee had the jitney bus bills and it reported one that was far different from that asked for by the street railway association. So the motorists have every reason to be thankful for what they received at the legislature's hands this year.

Race Drivers on Their Way to the Top

WITH this issue, Motor Age inaugurates a new department, a sort of "Who's Who" of race drivers that give promise of becoming stars of the first magnitude but who as yet have failed to reach the top of fame's crest. Because of his sensational showing in the Venice road race, in the last sixteen laps of which he made up 12 to 16 minutes lost at the pits in repairing a broken valve, Grover E. Ruckstell is given the place of pre-eminence and honored with the position of pace-setter.

Ruckstell is 28 years of age, and a native son, being born in San Francisco. After attending high school in that city, he decided to enter the motor car industry in 1905 and took up the study of expert repairing. Five years ago he went to Bakersfield, Cal., where he opened a garage and spent a great deal of his time tuning up cars for the motor sportsmen of the San Joaquin valley.

Having had a taste of speed, Ruckstell decided to become a knight of the khaki and in 1911 made his debut at the wheel of a racing car. In the first Stutz brought to the Pacific coast, the young Californian started in the 430-mile Bakersfield road race and led the field for 125 miles when he cracked a cylinder and was forced to retire. A short time after that he piloted



GUY RUCKSTELL

the same car in the Bakersfield track meet and captured a third.

In his first season of racing, Ruckstell showed such promise that he was given a

Mercer to drive in the Panama-Pacific road race of 1912. The car was owned by George Fiester, through whom he met George R. Bentel of the Pacific coast Mercer-Simplex agency, his present backer. He drove the Mercer at Bakersfield and won the cup in a race for cars of 300 cubic inch piston displacement and also established a dirt track record for 25 miles.

Ruckstell's first big race was at Tacoma last July. He competed in two of the speedway events, finishing second in one and fifth in the other. At Fresno, he captured a first and a third and shattered the 50-mile track record. At Corona, where Pullen hung up a new world's road racing record and Oldfield established a new non-stop mark, Ruckstell was in second place and almost in the shadow of the tape when he ran out of gas.

Ruckstell has been prominent in the Pacific coast racing events this year. At San Diego he took fourth money and finished third at Venice where he showed the way to the field for more than half the distance and put up one of the gamest finishes in the history of the sport.

The young Californian is going to the Mercer factory this month and, according to Eddie Pullen, will be at the wheel of a Mercer in the 500-mile international sweepstakes at Indianapolis.

April a Busy Month With Detroit Manufacturers

Fast Production Clip Maintained by Car Factories

DETROIT, Mich., April 5.—While Detroit car makers predict that April will exceed the business of the same month a year ago, nearly every one expects this month to be overshadowed in orders by May and June—an outlook which they say was not entertained so strongly at this time last year.

To a keen analyst, the reasons for a startling picking up in the motor business at this time are plain, and are but the logical outcome of conditions. People were hoarding money last fall when business conditions were uncertain, but now that general confidence is restored, they are letting go, and buying the cars, many of them having planned to do so before, but hesitating until they were sure they wanted to spend the money.

Better Spring This Year

Another reason for the rush which has come within a few weeks is that we have generally experienced a better spring than last year, the weather being brighter in most sections of the country, and this lets the road get harder earlier. Several factories can cite direct results of this. They say dealers and salesmen are turning the cars over to buyers almost as soon as they arrive, in marked contrast to last year when the vehicles sometimes accumulated before they could be disposed of.

Several manufacturers who have big fields for their cars in such states as Kansas and Missouri say that these communities have not opened up as yet. They have been under snow up to the present, but a few warm days are expected to open up these states for a big trade this year.

Asked as to production conditions, not every factory in Detroit will talk for publication, some being of an ultra-conservative turn of mind. But when assured that their data will not be published, they tell of startling activity, which they confess was not expected this year.

The eight-cylinder contingent is very busy, and their outputs are meeting expectations. Cadillac, the pioneer, has marketed to date 6,100 of its eight-cylinder cars, more than a hundred of them being in their home city. Before the close of the month, Cadillac expects to have stepped its production up to 125 cars a day. It is running considerably over that number now. One day last week, the output was 117, to be specific. As an indication of the gait to which the Cadillac factories are operating now, the working force is about 8,100 men, as compared with a maximum of 7,000 to 7,500 which was the most they ever employed in the rosiest days of their four-cylinder cars.

The King company, second to come out

By L. V. Spencer

with an eight, reports that the greater part of its average daily output of forty-five cars, are of the eight-cylinder type. The ratio is about three fours in every ten shipped. On this basis, the February production was 280 cars, total; that of March was close onto 400 cars. Quantity orders are reported, the English government week before last was shipped thirty-eight eight-cylinder cars, these going to London for distribution for war purposes. As late as last week, sixteen King eights went to Russia in one order.

While Claude S. Briggs, head of the Briggs-Detroiter company, another builder of eights, would give no figures as to production at this time, nevertheless he says his company has, for the last 6 weeks, been working night and day, with Sundays no exception. The eight is pushing the four in his estimation, and business is about half of each type of car, although Mr. Briggs predicts that before long the proportion will be 74 per cent eights and 25 per cent fours.

Naturally, such interest attaches to the doings of the Scripps-Booth Co., whose design of car and its lightness along with high-grade appointments are somewhat of a new thing to motoring. Its shipments now are better than ten cars a day, with indications that production will get up to 100 cars a week in another week. It is purely a matter of production with them, as over 4,500 orders are actually on hand with some 500 of them for immediate shipment.

The Saxon Motor Co. is now turning out seventy-five a day, fifty of which are of the small four-cylinder design, and the balance the new six. This is rapid going on such a new car, as the first of them did not get out until several weeks ago. All told, the Saxon company received 2,059 orders for its cars—fours and sixes—during March. Since the first of this year, the enlarged Saxon plant has built and shipped some 3,000 cars.

Eighty Hups a Day

The Hupp Motor Car Co. is also in on the good work. Lee Anderson reports that March this year was 22 per cent ahead of the same month a year ago. Just now the Hupp plant is working for a production of eighty cars a day—this has not quite been reached yet, but that will be the average day's output before the end of this week. It is about seventy-five a day now, and has been since the latter part of March. It is no small matter for a concern to step its production up even five cars a day.

In most motor departments Hupp is working a night shift to keep up. In March, there were 327 more immediate-

shipment cars than the plant could get out—that were carried over into April, but by Saturday, April 3, 320 of these had been filled. But on April 3, at the close of business, the books showed 594 immediate-shipment orders to be filled—April business.

Here are some figures showing orders received on the dates given: March 30, 86; March 31, 45; April 1, 392; April 2, 161; April 3, 58. Of course, all of these were not for immediate shipment.

Paige also is in the van. The production here for January, February and March is about 700 cars ahead of the same period a year ago, this despite the fact that due to the cars being of higher price—the new six replacing the former lower-priced four now discontinued—the value of product was greater. Last year the April production was 1,400 cars, and J. F. Bourquin, general manager, states that the same output will be adhered to this April. He says further that it looks as if it will hold up for May and June also; that last year a dropping off was foreseen for the months following April, but this season such is not indicated. The Paige people are turning out from forty-five to fifty cars a day, and there are about three sixes to every two fours.

Regal Rushed with Fours

The Regal company, also an eight-cylinder adherent, has not as yet commenced production on this type, its plant being swamped with four-cylinder business, according to Fred Haines, president. This week the production is twenty cars a day, but he confidently expects to get this in shape for a fifty-car-a-day output in the course of 2 weeks. This is on the basis of two-thirds small fours and one-third the larger four. There are over 5,000 orders on Regal's books for the small fours for immediate shipment, Mr. Haines says, proving that the demand for this type is still very strong despite the eight.

Regal eights will begin to come through about April 15, and between that time and August 1, the concern expects to build 1,000 of them on a ten-a-day schedule. As an indication of how Regal is moving, some 1,600 letters were received today on car-selling matters.

Dodge Bros. are doing considerably better than 100 cars a day now. The intention is to put the production up to 200 cars a day, but that cannot be done in a minute. One day not long ago, 139 Dodges were built, and this varies somewhat from day to day. There are now about 7,500 men on the Dodge payroll, as compared with about half this number in the days the Dodges were not car builders.

These statistical reports are not for every plant, as will be seen. Several of the big ones such as Maxwell, Packard,

Studebaker, Chalmers and Hudson did not care to talk.

However, Maxwell, for instance, is doing big things. One day last week, the production was 429 cars, and the average is not far below that number. Studebaker is enjoying an excellent business, as is Chalmers which is now engaged in its biggest shipments of the year. Likewise, Hudson is practically sold out, and Packard is "saying nothing, but sawing wood."

Just for variety, Ford has been forgotten for the moment. There is little use comparing its output with that of any other factory, because there is no plant in the world that can show up to advantage when we start out by saying what Ford is doing. The mammoth plant had the biggest month in its history during March. The production was 43,829 cars. March has 27 working days, so the average per day was 1,623 cars. It looks as if the Ford buyers will get the rebate.

COMPANIES REPORT EARNINGS

New York, April 2—The Vacuum Oil Co.'s annual report of its 1914 business, ending December 31, 1914, shows a decrease in profits, which was fully anticipated, owing to the interruption of commerce resulting from the war. What the total earnings of the company were in 1914 is not stated in the annual report, but exclusive of the company's share of profits in its foreign subsidiaries net earnings were \$2,075,644, a decrease of \$1,300,130. In 1913 the profits from the foreign companies amounted to \$1,457,156 additional.

The reduction in the capital requirements has made it possible for the company to declare a 2 per cent extra dividend. The balance sheet shows an increase in real estate, from \$3,501,109 in 1913 to \$4,139,791 in 1914. Accounts receivable amount to \$9,119,050, of which \$6,609,087 is due from foreign Vacuum Oil companies. Owing to the war it is not possible to determine the undivided profits on the shares held by the company in the various foreign marketing companies. While there has been some growth of business, cash surplus has increased from \$1,096,661 in 1913 to \$3,152,417 in 1914, due to a temporary reduction in capital requirements.

The Rubber Goods Mfg. Co. reports for the year ended December 31, last, net earnings of \$2,193,220 as against \$2,325,954 for 1913. Dividends amounted to \$2,143,984 as against \$2,862,518 for 1913. The total surplus for 1914 was \$9,003,042 as against \$8,576,510 for 1913. The balance sheet, as of December 31 last, shows cash amounting to \$3,115,153 and total assets and liabilities of \$53,937,815. The report states that two considerations materially affected the amount of sales in 1914, namely, the lower level of tire prices and the general business depression due to the European war.

The United States Rubber Co. has declared regular quarterly dividends of 1½ per cent on the common stock, 2 per cent on the first preferred stock and 1½ per cent on the second preferred stock. Dividends are payable April 30 to stock of record April 15.

A dividend of 1½ per cent on the common stock of the Kelly-Springfield Tire Co. has been declared, payable May 1, 1915, to the stockholders of record at the close of business April 15, 1915.

TO MARKET PARTIN-PALMERS

Chicago, April 3—The Commonwealth Motors Co., with C. C. Darnall as president, has been organized with a capital of \$100,000 to act as selling agent for the Partin-Palmer cars, taking over the functions of the Partin Mfg. Co. The manufacturing end of the business will be undertaken by the George D. Whitecomb Co., of Rochelle, Ill., an old established concern which has been manufacturing gasoline motors and electrical mining machinery. The general offices of the Commonwealth company will be maintained at 29 South La Salle street, Chicago, while the manufacture of the Partin-Palmer cars will be carried on at Rochelle.

President Darnall formerly was identified with the Partin Mfg. Co. as sales manager, but severed his connection last fall before the American Mfg. Co., which had the manufacturing end of the combination, got into financial difficulties which closed its plant. These court proceedings, however, did not involve the Partin company itself, which was left free to enter into



Obituary

GEORGE MCINTYRE MARSHALL, a well-known inventor of mechanical devices in Wisconsin, and credited with being one of the first persons in America to build and operate a self-propelled vehicle, died at Kilbourn, Wis., aged 81 years. He was a native of Canada and came to Adams county, Wis., in 1865. Mr. Marshall established a machine shop and invented and developed a number of important mechanical appliances, including a turbine water wheel, a windmill and blacksmith's shears. At this time he experimented with the application of the steam engine to road vehicles, but the merit of his designs seems to have been lost sight of. In 1870 Mr. Marshall was selected as one of the commissioners provided for by an act of the Wisconsin legislature appropriating \$10,000 as a prize to the person or persons who would build a self-propelled road vehicle capable of traveling 200 miles over a route wholly in Wisconsin at an average speed of 5 miles per hour. In 1879 he established a foundry and machine shop at Kilbourn, retiring in 1900 to devote his remaining years to experimentation and invention. His sons are still operating the business as the Kilbourn Machine Co.

this new deal whereby its good will and its 1915 contracts with some 400 dealers are taken over by Mr. Darnall and his colleagues.

Shipments of parts and machinery from the old plant here in Chicago, formerly occupied by Staver, are being made now and it is anticipated that cars will be turned out from the Rochelle factory at once so that shipments may begin almost immediately. It is said that the company now has orders booked for 800 cars.

It is declared that this deal permits the new combination to start out without any embarrassment from the previous arrangement, and that there will be very little interruption in the marketing of Partin-Palmer cars.

Associated with Mr. Darnall are W. H. Conklin, who has been elected secretary and sales manager, and T. J. Shanahan, formerly production manager, who will be connected with the manufacturing end of the business. Outside of these there are none left from the old regime. W. C. Whitcomb, president of the Whitcomb company, is vice-president of the Commonwealth, while D. G. Kingery, a brother-in-law of Mr. Whitecomb, will serve as treasurer.

NEW LIST ON JEFFERY FOUR

Kenosha, Wis., April 5—"As a result of the sale of large quantities of Jeffery cars to all parts of the world with a consequent reduction in manufacturing costs" is the reason given by the Thomas B. Jeffery Co. for the reduction in the list price of its four-cylinder model from \$1,450 to \$1,150, which announcement was made today. "The purpose of this announcement is to give to Jeffery purchasers, Jeffery dealers and Jeffery friends their share of the benefit of this prosperity that has come to the Jeffery company," is the statement made.

JEFFERY WORKING 24 HOURS DAILY

Kenosha, Wis., April 5—Coincident with the announcement of the new list on its four-cylinder is the statement that the Jeffery company has received \$4,000,000 worth of truck orders in 3 weeks' time so that 500 men have been added to the factory working force, the entire staff now laboring 24 hours a day in three 8-hour shifts.

MILWAUKEE EXPANDING

Milwaukee, Wis., April 5—The Milwaukee Automobile Dealers, Inc., is the title of a new organization that has supplanted the Milwaukee Automobile Dealers' Association. The association comprises practically every dealer in Milwaukee and the charter membership is thirty-two. Under the new articles, the corporation will have much broader powers and activities than the old association and its work will extend throughout the state of Wisconsin rather than being solely a Milwaukee affair. Frank J. Edwards is president.

Quaker Probes Into Jitney Situation

Philadelphia Official Reports on Trip

PHILADELPHIA, Pa., April 3—The return to this city of Director of Public Safety Porter from a 3-weeks' trip through the west, where he has been studying every phase of the question, has put a new outlook in the local jitney bus situation. Based on the knowledge gained from his investigations of the jitney in San Francisco, Los Angeles, Portland and other western cities the director has come to the conclusion that the jitney is a nuisance so far as public safety is concerned unless there be legislative or police regulation. He approves of the new method of cheap transportation under proper supervision, but asserts that uncontrolled they are crime-breeders.

"It is the newest and most up-to-date form of transportation," he said, "and no doubt the jitneys are here to stay. I am in favor of them if they are to be regulated, but as operated in Philadelphia at present they are a nuisance. Like every other public conveyance they must be subjected to reasonable regulations, the adoption and enforcement of which are necessary for the safety of the public."

"Officials of the cities in the west I visited informed me that without proper supervision the jitney bus developed into an aid to the activities of pickpockets and women flirts. Pickpockets particularly used the jitney. Working with the driver, they get a victim between them in a car and while they are bouncing him over bumps in the streets relieve their victim of money and valuables. No such complaints have been received in this city yet, but with the rapid growth of the jitney here I have no doubt it will be our experience as well as that of the police of other cities. In San Francisco since the advent of the jitney pocket-picking increased 200 per cent."

On the other hand, if properly regulated by law, the director believes they can be made to develop into a service that will add enormously to the comfort and convenience of the community and public.

The popularity of the jitney in western cities, according to the director, has been such that the transit companies in only a half a dozen have lost millions of dollars in fares since their introduction and that contemplated extensions of trolley lines have been abandoned as no longer required. On this subject the director said:

"We do not expect the jitney to affect our trolley lines in such a way, but if the buses are properly regulated they will develop into a service that will add materially to the comfort and convenience of the community. However, they won't amount to much until they adopt regular routes and stopping points."

Several plans for the regulation of motor buses are under consideration, the one most favored being to have a jitney official connected with the bureau of police in charge of buses, similar to San Francisco.

The bill recently advanced in Harrisburg to regulate the operation of jitney buses, to require owners to give large bond to cover possible damages and to exact 10 per cent of their gross earnings was rejected by the committee on roads of the house of representatives.

Legislation to govern motor bus operation will be pushed without delay, for indications promise an enormous increase in their number with the opening of the baseball season inside of 2 weeks.

The fifty-odd machines that regularly traverse Broad street had a severe tryout today when the blizzard hit Philadelphia. While the trolley service was decidedly irregular, to say the least, most of the jitneys were ploughing their way through the snow but little behind their regular schedule, and ten times their number would have carried capacity loads had they been available. The service was a lifesaver.

Principally through the efforts of the Germantown Business Men's Association, which organization repeatedly made unsuccessful efforts to get a direct trolley service between Germantown and Roxborough, a short time ago a jitney bus line was established between the two outlying sections. The jitneys have proved a boon to business also, as is attested by a proposition now being considered by the Germantown merchants of paying passengers' fare when purchases of \$1 or more are made. Another plan receiving serious consideration is the running of a jitney every afternoon at a certain time to carry nothing but packages from Germantown to a designated station in Roxborough, where the purchasers from the latter section could call for them, thus inaugurating a jitney bus delivery service.

LATEST FROM LOS ANGELES

Los Angeles, Cal., March 29—The jitney bus situation has assumed a new phase in Los Angeles. A member of the mounted traffic squad tied tags on fifteen or twenty jitneys standing on Hills street, between Fifth and Sixth streets, yesterday, ordering the owners to appear in police court for violation of Section 7 of the traffic ordinance. This section makes it unlawful for the owner or driver of any "for hire" vehicle to stand upon any street in the business district unless such person shall have procured a permit in writing for such privileges from the board of police commissioners.

Upon being notified of the action of the

police officer, Harry Pool and E. L. Williams, president and secretary of the Auto Bus Owners' Association, hurried to the offices of their attorneys.

One of the jitney owners served, it is claimed, had removed his route signs and had gone into a store to make a purchase. The jitney men of the city and members of the association were indignant at the action of the police department.

The Auto Bus Owners' Association attorneys claim that if the jitney men are to be prosecuted for violation of section 7 of the traffic ordinance, the city can not collect more than \$7.50 per quarter, the license fee for rent machines that occupy stands.

SITUATION IN BALTIMORE

Baltimore, Md., April 3—A certain class of Baltimoreans, especially friends of the United Railways and Electric Co., city officials and officials of the railway company are viewing with alarm the rapid strides that the jitney service has made in Baltimore since its introduction here a little more than a month ago.

A conservative estimate places the daily haul of the jitneys between 15,000 and 20,000 passengers. At the former figure it is shown that the United Railways is losing at least \$750 daily, exclusive of Sundays. From that amount of money the railway company under the present law is forced to pay 9 per cent, or \$20,250, which goes toward maintaining the public parks of the city. It is the loss of the park tax fee that is causing the officials the worry, and the loss of the patronage is causing the stockholders of the road no end of worry, for they realize it means a depreciation in the value of their holdings.

At every corner or important junction traversed by the jitneys in the city the railway company has clockers taking a record of the number of passengers carried by each car. Other methods of holding up the jitney services are being used. For instance, railway officials have complained to the police about the jitney drivers violating the traffic laws by excessive speeding and by crossing rapid transit streets faster than the law allows. Many of the policemen in sympathy with the jitneys have turned their backs at violations when possible, but one man was arrested for exceeding the speed limit with his jitney.

A police census shows thirty-five different lines within the city limits, exclusive of service into suburban points. The Henderson line runs about eight cars, and is probably the largest line. All of the lines will increase the number of cars on their lines just as soon as they can obtain the necessary equipment.

Jitneys may be operated much cheaper in Baltimore than in many other cities. This will in itself go a long way toward bringing in additional lines almost daily, which has happened in the past few weeks and the end is not in sight.

A comparison between figures sent out from San Francisco and those in Baltimore shows the balance to favor this city. The San Francisco figures show that it cost \$9.23 to operate a car 150 miles, while in Baltimore the same type of car can be operated for \$9.64, for 220 miles. Several things go to make up the difference in favor of Baltimore, the chief item being insurance. Local companies are unable to get insurance for their cars now, but the first few that entered the field were able to get that protection.

Wages also play an important part in keeping down expenses here, for in this city the highest paid is about \$15, while many are working for \$10 and \$12 weekly, and in San Francisco the wages are \$25 weekly.

Figures sent out from San Francisco, as compared to Baltimore, are as follows:

	San Francisco per year	Baltimore per year
Six per cent interest on half of \$600 investment.....	\$ 18	\$ 18
Insurance	192	...
Depreciation	300	300
Storage	120	120
Driver's wages.....	1,200	780
Licenses	28	15
Jitney association dues.....	12
Yearly fixed charges total.	\$1,870	\$1,233

AS IT IS IN NEW ORLEANS

Washington, D. C., April 3—Conrad Syme, corporation counsel of this city, who is making an extended tour of the country studying the jitney bus situation, has sent a report to the commissioners on his observations in New Orleans. He says the jitney bus has come to New Orleans to stay and that Washington offers as favorable an opportunity for its operation as the southern city.

"The desire is strong here," said Syme, in his New Orleans' report, "to have the jitneys confined to certain routes. I think this will be difficult and that so far as jitneys run by individual owners or operators are concerned they should and will only be confined to the routes indicated on the publicly displayed card. The regular jitney bus lines, with regular cars carrying about twenty persons probably will desire defined routes. It seems very essential that each car should display on the interior the name and number of the owner or operator, so as readily to identify the same in case of accident. There are in New Orleans about 400 individually-owned jitneys, comprising cars of all types. There also is a jitney line of six or eight cars, capacity twenty, going over a regular route of 2½ miles long.

"The individual jitneys are licensed at \$30 a year. They are not publicly regulated as to routes. Their routes are, however, usually indicated by a card on the windshield, showing in large letters the streets over which they run or the points between which they operate. A very strict police regulation has been enacted requiring them to see that there is no danger from behind when they stop, which regulation should work well."

Chicago Taxicab Rates Are Slashed

Rivals Drop Below the Legal Prices

CHICAGO, April 1—Upon the heels of the reduction in the legal rates of fare for taxicabs by the recent action of the city council, there is announced by a new cab concern a further cutting of the schedule which makes the use of taxis still less expensive. The rate war, if there is to be such, is brought on by the entrance of a new company in the field, the Atlas Co., whose rates, it is announced, will be from two-thirds to one-half the present schedule and considerably lower than the new ordinance rates, which go into effect in 2 weeks.

The Atlas company proposes to use a fleet of twenty-five 1915 Chalmers limousines and the rates, as compared with the present and new ordinance schedules, are as follows:

	Present Rate	New Or- dinance	War Rate
First mile.....	\$0.70	\$0.60	\$0.50
Each additional ¼- mile10	.10	.05
Each additional passenger20	.15	.10
Each hour wait... .	1.50	1.50	.80

Announcements of the new company followed immediately upon the publication of the plans of the new Yellow Cab Co., which were outlined last week in Motor Age. This company, whose officers are the same as those of the Walden W. Shaw Co., is putting on the streets 100 cabs, to be operated strictly on the European plan. That is, the method followed in Europe is to be employed, in which taxis are picked up on the street or on public stands, instead of from the private branches at clubs, hotels and cafes. Also, the European system is on a strictly cash basis, charge accounts being unusual.

The Yellow Cab company's vehicles will be painted yellow, to distinguish them from the Shaw cabs. They are much lighter and more economical than the latter, out they seat four passengers and are fitted up in the same style as the others.

The schedule of rates for the service of

the yellow cabs has not been decided upon fully, but it is announced that the rates for shopping and calling will be \$2 per hour and the meter rates approximately 60 per cent of the present rates. The burden of expense that is necessary to operate the present Shaw service is too great to be borne by a company that charges as low rates as the yellow cabs. Consequently, the clerical help, telephone operators and similar service connected with the credit system will be eliminated by the cash fare arrangement. Likewise the private branches with uniformed attendants, the initial high cost of the big cars, greater fuel and tire cost, greater insurance and depreciation are not factors in the operation of the yellow cabs as they are in the older ones.

There are six major taxicab companies in the city, but they do not express alarm at the incursion of the Atlas company with its lower rates, and express the opinion that operating expenses will prove too great for the new concern to continue very long with its low fares.

ATLANTIC CITY INVADED

Atlantic City, N. J., April 3—The jitney bus has taken this resort by storm. So popular did its introduction prove that within a week nearly a dozen lines were doing a rushing business and as many more promise to be operating before the end of another week.

So far the operations of the jitney are confined to the city proper, but now it is planned to connect the resort with the mainland. In the course of a few days a line will be in operation in which all the cars will be driven by women and carry only women passengers.

The proposition to connect Atlantic City with Camden, by means of a motor road, is again being agitated by the beach front hotel proprietors.



CHICAGO TAXICAB OF
YELLOW CAB CO.

Dairy Products Pay for Farmers' Cars in Wisconsin

MILWAUKEE, Wis., April 3—Bossy pays the bills in Wisconsin. The milch cow is responsible for the great wealth of the Badger state. It has given Wisconsin first rank among the commonwealths of America as a dairy state. It has made it possible for 13,500 farmers in Wisconsin to own motor cars. It will make possible in 1915 a sale of not fewer than 5,000 cars out of the total of 20,000 cars which Wisconsin dealers expect to distribute in this state this year.

Because bossy pays the bills—and she paid a mighty large bill last year—Wisconsin farmers, whose legions number 180,000, will this year be one of the most prolific sources of business for the builder of motor vehicles. In the final reckoning by the factories and their dealers, the position of Wisconsin as the richest and most productive dairying state in the union makes a conspicuous factor. To one who has studied the situation at first hand and with a raft of statistics at hand, it appears that the dealers do not reckon sufficiently high when they enumerate Wisconsin's rural absorption of 1915 cars at 5,000. Results may bear out an estimate of 7,500 or even 10,000.

Predict a 20,000 Sale

As well-posted men see the situation, Wisconsin will take not fewer than 20,000 cars in 1915, and approximately one-half of these will go on the farm because the city man's resources at this period do not begin to compare with the resources of the farmers of Wisconsin, due to the splendid crops of 1914 and the enormous dividend which the dairy industry has paid.

Wisconsin farmers have hardly begun to buy motor cars. Alex J. Cobban of the secretary of state's office figures that 13,500 of the 53,161 cars registered in Wisconsin by private owners in 1914 belonged to farmers. He estimates that in 1913, about 6,750 of the 34,646 cars registered were on the farms. He says the comparatively richer state of the farmer as against the city dweller at this time means that the 100 per cent increase in



by LEMeyer

Badgers Expect to Sell 20,000 Cars This Year—Prosperity in Rural Districts

rural registrations will be exceeded, and that 7,000 to 8,000 farmer cars can be expected to be added this year.

Wisconsin took 18,500 new cars in 1914. The 1913 registration of private owners, amounting to 34,646, jumped to 53,161 in 1914, an increase of more than 50 per cent. And this in the face of one of the most depressing periods, industrially speaking, in the history of the state. But bossy pays the bills and the rural districts of Wisconsin never passed so good and great a year as 1914. Even the most conservative admit that 1915 will see the 1914 increase equalled, and that will mean a distribution of approximately 20,000 cars in Wisconsin this year.

Secretary a Poor Guesser

When the secretary of state of Wisconsin made his contract for 1914 license plates, the figure was 45,000, being based

on a 34,646 registration in 1913. Before the year was half over the supply had run out and 8,161 additional sets of plates had to be purchased to supply the demand up to the close of activities. Last fall the secretary placed an order for 70,000 sets of plates, which means that he figures 16,839 new cars will be registered in 1915. If the secretary is as poor a guesser this time as he was last, the emergency supply being the same, Wisconsin's 1915 registration will be more than 75,000.

Of the 2,500,000 people in Wisconsin today, approximately 1,000,000 are German-born or of German origin. Thirty-three per cent of the population of Wisconsin is native American stock. Forty per cent is German. Twenty-nine per cent is divided among Norwegians, Swiss, English, Canadians, Irish, Bohemians, Belgian, Austrian, Polish, Dutch, Finns, Danes and Italians.

The peculiar character of the population of Wisconsin, however, is a powerful factor in determining the cause of the immense dairy industry. Wherever a population map shows Germans, Swiss, and Danes thickly settled, a dairy survey map shows a predominance of creameries and cheese factories. It is their inheritance. The fact that the Norwegian, who is second in number to the Germans, has not generally taken to dairying, but prefers to raise tobacco, indicates that dairying is not acquired as a result of Wisconsin influences.

Distribution of the Cars

Last year's registration of 53,161 shows exactly that number of cars distributed among approximately 2,500,000 people, or a ratio of one to forty-seven. A glance at the list of sparsely settled counties in the wilds of northern Wisconsin show few motor cars. For 2 years a monumental effort has been under way to develop these sections, and the campaign already is bearing fruit. There are several counties having fewer than 100 cars and a few under fifty. The splendid system of state-aid highway construction in Wisconsin has reached these districts and just so sure than the motor car follows the good road, when it does not actually inspire good road work, so will these districts during 1915 and coming years increase their car population, and in a much greater proportion than the more thickly settled portions.

State distributors who do business from Milwaukee are almost as a unit in predicting that 1915 sales will make their mark on the basis of farmer trade. The farmer has money; that is positively indi-

WISCONSIN WEALTH IN FARMS AND LIVE STOCK

Total tax levy, 1911.....	\$ 32,610,975
Assessed valuation, 1911.....	4,718,108,684
<i>Livestock Statistics for Wisconsin—</i>	
Horses	Number 678,000 Value \$ 92,355,000
Mules	3,000 381,000
Milch cows.....	1,626,000 96,747,000
Other cattle.....	1,216,000 33,683,000
Sheep	781,000 3,905,000
Swine	2,255,000 27,060,000
	\$254,131,000

URBAN POPULATION, 1914. Cities over 10,000

Milwaukee	419,054	Fond du Lac	20,367
Racine	44,528	Eau Claire	18,647
Superior	44,344	Wausau	18,352
Oshkosh	35,097	Appleton	17,492
LaCrosse	31,367	Beloit	17,122
Madison	29,468	Marinette	14,610
Kenosha	29,062	Janesville	14,195
Green Bay	28,064	Manitowoc	13,563
Sheboygan	27,863	Ashland	11,594

cated by the vast gain in deposits shown by country bank reports this month. The farmer has been a good customer of the motor car builder, but only the surface has been scratched. The income from \$260,000,000 worth of livestock this year and last will make expenditures of \$500 to \$1,200 for motor cars a drop in the bucket. The worth and value of mechanical appliances on the farm has long ago, been demonstrated and with it an ever-growing estimate of the economy of the motor car on the farm inculcated.

The college of agriculture of the University of Wisconsin, with its unequalled extension service, has seen to that. Its bulletins even today concern themselves as much about the care, repair and maintenance of motor cars as about harvesting and cultivating appliances.

Epidemic Not Feared

Wisconsin was the center of the epidemic of foot-and-mouth disease during the past winter. But the losses occasioned by the wholesale slaughter of cattle are insignificant compared with the total value of all cattle owned in the state. The cost of the epidemic will not in the least affect the purchase of cars.

Unfortunately the state law providing for motor registry does not give the secretary of state's office sufficient leeway to undertake a statistical digest of present registrations by names of makes. Naturally, the Ford predominates, both in city and country. Overland, Buick, Maxwell and Studebaker follow in the low-priced car sales. Case and Mitchell, Wisconsin products, make a surprising showing in the medium-priced car line. Rough estimates give an average value of \$900 per car in Wisconsin.

So far this year, or on April 1, to be exact, the Wisconsin registration is 33,575, while 1,071 dealers' and 2,403 motorcycle licenses have been issued. This is more than half of the entire 1914 registration. A year ago at this time the private owners' registry amounted to only 17,250 motor cars.

Rush for Licenses

Wisconsin's system of registration gives an accurate check on the actual number of cars in use. All cars must be registered on January 1. An owner may sell his car and use the old license on his new purchase by paying a fee of 50 cents for the transfer. The purchaser of the car must take out a brand new license at \$5. Dealers pay \$10, which gives them four sets of plates and the privilege of buying additional sets at \$1 per pair from the state.

At this time the secretary of state's office is receiving applications for new licenses at the rate of 800 per day. The rush usually ends about April 30, this being the start of the real motoring season in the larger part of the state.

The past winter has been ideal from the crop growers' standpoint; the banks are filled with farmers' money; the dairy

WISCONSIN REGISTRATIONS FOR THE LAST 3 YEARS

	1912	1913	1914
Motor cars, at \$5 each.....	\$ 24,578	\$ 34,646	\$ 53,161
Motorcycles, at \$2 each.....	4,060	6,120	7,880
Dealers, at \$10 each.....	1,052	1,393	1,202
Total Revenue	\$136,270	\$199,400	\$293,585

WISCONSIN REGISTRATION BY COUNTIES FOR THE YEAR 1914

County.	1910 Popul.	1914 Regist.	County.	1910 Popul.	1914 Regist.
Adams	8,604	105	Marathon	55,054	704
Ashland	21,965	169	Marinette	33,812	280
Barron	29,114	497	Marquette	10,741	242
Bayfield	15,987	106	Milwaukee	433,187	8,602
Brown	54,098	853	Monroe	28,881	402
Buffalo	16,006	367	Oconto	25,657	240
Burnett	9,026	118	Oneida	11,433	89
Calumet	16,701	566	Outagamie	49,102	808
Chippewa	32,103	507	Ozaukee	17,123	388
Clark	30,074	498	Pepin	7,577	149
Columbia	31,129	853	Pierce	22,079	450
Crawford	16,288	198	Polk	21,367	373
Dane	77,435	2,722	Portage	30,945	457
Dodge	47,436	1,498	Price	13,795	99
Door	18,711	283	Racine	57,424	1,425
Douglas	47,422	424	Richland	18,809	586
Dunn	25,260	510	Rock	55,538	1,770
Eau Claire	32,721	572	Rusk	11,160	145
Florence	3,381	52	St. Croix	25,910	528
Fond du Lac	51,610	1,588	Sauk	32,869	1,019
Forest	6,782	44	Sawyer	6,227	37
Grant	39,007	1,270	Shawano	31,884	468
Green	21,641	819	Sheboygan	54,888	1,401
Green Lake	15,491	429	Taylor	13,641	180
Iowa	22,497	602	Trempealeau	22,928	429
Iron	8,306	34	Vernon	28,116	658
Jackson	17,075	258	Vilas	6,019	27
Jefferson	34,306	970	Walworth	29,614	1,293
Juneau	19,569	196	Washington	8,196	87
Kenosha	32,929	746	Washington	23,784	797
Kewaunee	16,784	325	Waukesha	37,100	1,235
La Crosse	43,996	942	Waupaca	32,872	761
Lafayette	20,075	514	Waushara	18,886	478
Langlade	17,062	205	Winnebago	62,116	1,339
Lincoln	19,064	226	Wood	30,583	523
Manitowoc	44,978	1,020	Total	2,333,860	53,161

herds are ready to produce a wealth greater than during last year, so it is reasonable to expect the farmer of Wisconsin to be the prime factor in car buying for 1915. In the cities conditions are better than a year ago at this time; in fact, conditions everywhere in Wisconsin are considerably improved. If 1914 brought a sale of 18,450 new cars, there is every reason to expect 1915 to produce 20,000 new sales. This means an investment of \$20,000,000 and an additional expenditure of approximately \$2,500,000 for

supplies, accessories and extras. And, if not all of it, bossy will pay a good share of the bill.

SCOTCH PLANTS SEIZED

Glasgow, April 5—All motor car plants in Scotland have been placed under government control, in pursuance of the government's plans to accelerate the supplying of war material. These plants in the future will be run night and day in the production of motor lorries for the transport department.

Bossy Makes the Motor Go *by J. C. Burton*

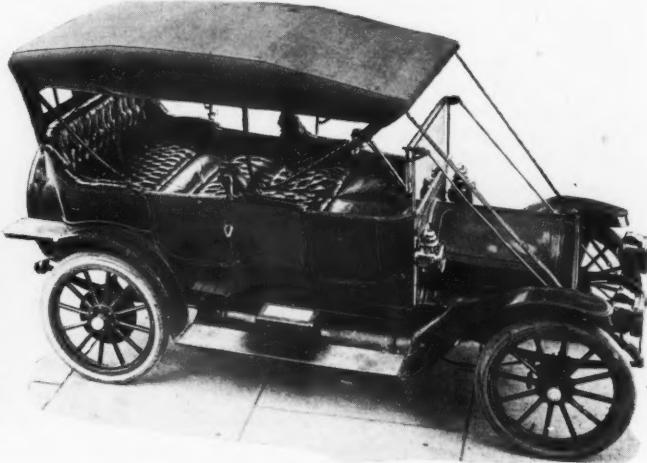
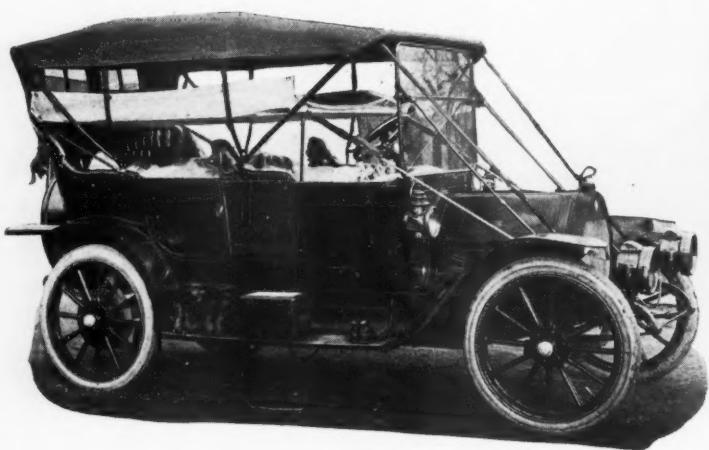
Now bossy makes the motor go up in the Badger state
And dairymen are prospects for the four, the six, the eight;
The herds of lowing Jerseys and the sad-eyed Belted Dutch
Put gas'line in the fuel tank and coal oil in the clutch;
At sunrise buxom milkmaids to the dew-kissed meadows steal;
At sunset, all are movie-bound abaft the steering wheel.

The cattle of Wisconsin, unlike other grazing herds,
Produce coupes and limousines instead of cream and curds;
Each Guernsey has a battery imbedded in its throat
And does not moo like common kine, but sounds a warning note;
And when it seeks the pasture at the dawn of golden morn,
The bell cow does not wear a bell but toots a motor horn.

For bossy pays rich dividends and makes the engine throb
And farmers will wear goggles there with milch cows on the job;
Each can of milk, each butter tub, each pound of fragrant cheese
Adds to the song of plenty that the rural motors wheeze;
The banks are choked with coin and the roads are choked with cars—
The Milky Way is worshipped when the Badgers bless their stars.

Routes and Touring Information

Denver Man Makes Pullman Sleeper Out of Touring Cars



ILLUSTRATIONS SHOWING OPERATION OF ORTON'S SLEEPING BERTHS

AN invention which makes camping in the open a simple and inexpensive matter for motor tourists has been patented by A. Orton, of Denver, who has organized the Orton Sleeping Auto Co. to manufacture his lower and upper berths for all makes of touring cars. The devices provide ample conveniences for outdoor sleeping and can be installed without materially changing a car for ordinary use. The lower berth is constructed of cushions and adds about 40 pounds in weight, while the upper berth is made of heavy fabric and steel rods and weighs only 20 pounds.

Installing the lower berth requires hinging the back of the front seat, fitting a narrow strip of wood across the dash to support one edge of the filler cushions and perhaps two or three other simple bits of work for a mechanic, after which the sleeping equipment can be placed or removed in a few minutes whenever used.

The upper berth is even more easily installed, requiring no work on the car itself beyond putting in a couple of bolts to serve as seats for the steel legs sup-

porting the front end of the berth. Four straps, two clamps, two brackets and a sort of cable tension device similar to a top-tightener complete the attachments for this upper berth, which rests on the back of the rear seat and the two legs, is held in place by brackets fastened at the base of the main rear bows of the top and is adjusted to the proper tension by the tightening device. The stock size of the upper berths is the same as that of a standard bed, 6 feet long by 54 inches wide, but other sizes are furnished when specially ordered. The berth has side walls 10 inches high, can be placed or removed in a few minutes and can be rolled up into small compass and put out of the way in a dustproof cover. A convenient tray also is provided across the regular back of the front seat for carrying blankets, etc., away from the dust.

A part of the lower berth equipment is a lazy-back fitted to the back of the front seat. This can be used for an extra rest or can be folded down over the bedding tray to allow the rear passengers a better view ahead. This lazy-back feature is

claimed to make the front seat easier to ride in than the back one.

By letting the main back of the front seat and this lazy-back down into sleeping position, putting one front filler cushion into place and using the other filler cushion as a temporary lean-back for the driver, a car can be quickly made into a temporary ambulance for emergency use.

Either berth will comfortably accommodate two or three persons, and as many as seven can sleep in a car equipped with both berths where there are two or three children in the party.

Filler cushions, cooking utensils, etc., can be carried in a tire trunk with compartments specially arranged to economize in space.

For the average car the cost of the lower berth is \$50, plus the slight expense of having the seat back hinged and other essential alterations made. The price of the upper berth is \$20 and up, according to the weight of the fabric used and whether it is ordered larger than the regular size.

Answers to Inquiries for Routes from Motor Age Readers

ANDOVER, Pa.—I am going to motor next summer from Buffalo, N. Y., to Boston, and would like to know some of the interesting points of interest in New England.—G. E. Warden.

As you undoubtedly will take the central New York route across New York state, which will bring you into Albany, we suggest then that you go to Boston through the Berkshire hills to Springfield, then the Old Post road into "The Hub." The Berkshire hills are truly one of the most enchanting spots in New England, and rich in Revolutionary history. The tranquillity of the mountains, the beauty of the rivers and lakes, the scenes of many great historic

events, will always interest and inspire. Berkshire, in the heart of the Berkshire hills, is well worth a visit of several days, not only on account of its attractions, which are manifold, but as a convenient center for a dozen or more pleasureable excursions. If you have a file of Motor Age, suggest that you read the article in the September 17, 1914, issue, entitled "Through the Berkshires—The Tour Idyllic." It will give you a wonderful vista of the charms and beauties of this locality.

It was at Pittsfield, in the Plunkett home-
stead, that Longfellow wrote "The Old Clock
on the Stairs"; here in the hills lived Bryant,
Holmes, Hawthorne, and many other poets,

dear to all of us; they too loved the hills and felt their inspiration.

A particularly delightful trip is the one over the Berkshire hills, via the famous Jacob's Ladder, to Springfield. It is a macadam road the entire distance. Springfield is an up-to-date manufacturing city. The United States armory and arsenal are located here. This city was the scene, in 1786, of Shay's rebellion, and a marker recalls to the tourist this incident of the city's early history. Here, too, lived men of note.

Continuing eastward to Boston, the route now lies over what is known as the Old Boston post road, which dates back to 1673.

Today, it is a macadam thoroughfare, passing through the beautiful city of Worcester, the original envelope town. Along this entire route you will find attractions within easy reach, but space will not permit going into detail. Some of the points of historic interest in Boston and its environs are Fanueil Hall, the "Cradle of Liberty," built in 1742; Griggin's Wharf, where the Boston Tea Party took place; Old North Church, Boston Common, Bunker Hill monument and the Old State House. Boston also offers many attractive excursions, all of which are full of interest and scenic beauty.

Volume 2 of the Blue Book covers the New England section and you will find this a valuable adjunct, giving as it does complete running directions, points of interest, etc. Published by the Blue Book Publishing Co., Chicago. Price \$2.50.

Chicago-New York City

Austin, Minn.—Editor Motor Age—I desire to motor east about the middle or latter part of July, going to Chicago first. I am familiar with the route to Chicago, but do not know the routing from Chicago to New York or Atlantic City. Kindly give me the best route and mention the points of interest; also advise if route goes over the mountains and if these roads over mountains are good or dangerous trails.—F. A. Schleuder.

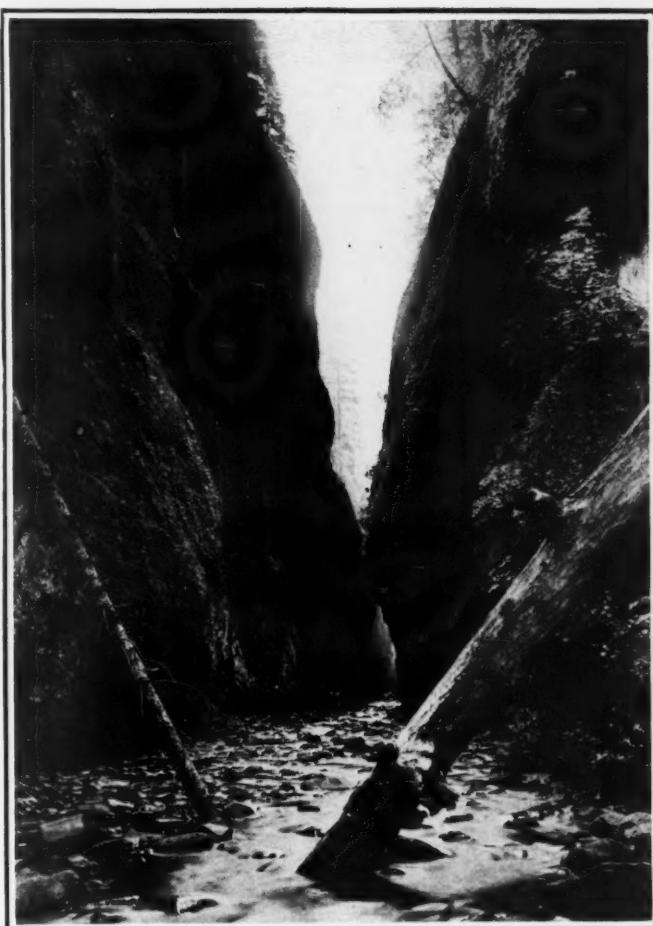
From Chicago it is a run of 100 miles to South Bend via Hessville, Gary, Hobart, Valparaiso, Westville, La Porte and New Carlisle; and 164 miles to Toledo, O., over gravel roads through Osceola, Goshen, Ligonier, Kendallville, Bryan Wauseon and Crissy.

Go east 119 miles to Cleveland, driving through Fremont, Norwalk, Oberlin, and Elyria.

Following the shore of Lake Erie on the Central New York highway to Buffalo, 196

miles of good road, one passes through Willoughby, Painesville, Unionville, Ash-tobula, Conneaut, Springfield, Girard, Erie, North East, Westfield, Fredonia, Silver Creek, Brant, Hamburg, Lackawanna, Buffalo, Niagara Falls is but a run of 26 miles from Buffalo over a macadam and brick road.

You are now at the threshold of scenic New York state, and leaving Buffalo the trip to Albany takes one through the beautiful finger-lake region and the historical Mohawk valley, so that in planning such a trip, one should endeavor to allow plenty of time to make it in leisurely fashion. Good roads are found the entire distance of 371 miles, driving through Batavia, Leroy, Caledonia, Avon, East Bloomfield, Canandaigua, Geneva, Seneca Falls, Auburn, Sennett, Syracuse, Chittenango, Vernon, Kirkland, New Hartford, Utica, Mohawk, Herkimer, Little Falls, Fonda, Amsterdam, Schenectady, Albany.



ONEONTA GORGE, SCENIC BEAUTY SPOT ON COLUMBIA HIGH-WAY IN OREGON



MULTNOMAH FALLS, 700 FEET HIGH, ON THE COLUMBIA HIGH-WAY IN OREGON

From Canandaigua a side trip to Watkins Glen would be found delightful, it being but a 50-mile run over macadam almost all the way via Hopewell, Penn Yan, Reading Center, Watkins. If the return trip is not to be made to Canandaigua, then route to Seneca Falls, on the east side of Seneca Lake, 39 miles through Valois, Ovid, and Fayette, and continue east to Syracuse.

From Albany to New York the route parallels the Hudson river the entire distance of 147 miles, and takes one through Rensselaer, Kinderhook, Hudson, Red Hook, Rhinebeck, Hyde Park, Poughkeepsie, Fishkill Village, Peekskill, Ossining, Tarrytown, Yonkers, New York City.

Atlantic City is 133 miles from New York City, over good roads. Leaving the metropolis from the Weehawken ferry, West Forty-second, proceed to Jersey City, thence through Newark, Elizabeth, Rahway, Perth Amboy, South Amboy,

Marlboro, Lakewood, Waretown, Absecon, Pleasantville, Atlantic City.

Space will not permit going into detail on the points of interest. Secure volumes 3 and 4 of the Blue Books, published by the Blue Book Publishing Co., Chicago; these not only give running directions but mention many of the more important points of interest. There are no dangerous trails on this route; in fact, that portion between Cleveland and New York might be styled the boulevard route, it being a macadam road the entire distance.

Route to Telluride, Colo.

Montrose, Colo.—Editor Motor Age—On pages 28 and 29 of the March 11 issue of Motor Age, a reader is directed to motor to Telluride, Colo. He is advised to go south from Pueblo and thence to Durango and then to Telluride. This is an error. Impossible to get that way at all, except to ship car. There is absolutely no road from Durango to Telluride for scarcely a wagon, let alone car. The way for him to go is as follows, and the only way: From Pueblo west to Canon City and Salida. If he comes before June, he should then go over Poncha pass to Saguache, thence over Cochetopa pass to Gunnison, down the Gunnison river to Sapinero, thence over Blue mesa to Montrose; thence south from Montrose to Telluride. If he comes after the first of June, from Salida he can come over Monarch pass to Gunnison, which is a little nearer than over Cochetopa.

Cochetopa pass is the lowest in the state and will soon be open, probably about the middle of April, while Blue mesa will be open about that time and the road south from Montrose over Dallas divide will be ready also. These roads are excellent mountain roads. This is the Santa Fe trail and

Rainbow route. Telluride is reached only by motor car from Montrose. It is about a 3 hours' run ordinarily after snow is off.—The Montrose Press.

A Circle Tour to California

Fairmont, Minn.—Editor Motor Age—Would Motor Age advise me to take the southern route to the coast, via Denver, Colorado Springs, La Junta, Trinidad, Raton, Las Vegas, Albuquerque, Santa Fe, Phoenix, Yuma, Ariz., to San Diego with my wife and two children? We expect to leave southern Minnesota the first of June, reaching Arizona the middle or latter part of June, thence take in both fairs, after which we are planning to drive to Seattle, and return home by way of the Yellowstone park in August.

Could we take in to good advantage the most interesting sights and noted places and parks by taking this route?

Also, advise where we can procure copies of "The Tourist's California" by Ruth Kenzie Wood, and "Our Unknown Southwest."

Is the desert planked at the bad places between Yuma and San Diego?—C. H. Brodt.

It seems that you have made a most happy selection of routes for your tour and you should experience no difficulties or hardships whatever at the time of year that you plan to make your trip.

Unless the spring is unusually late and there is a great amount of rain in Nebraska and Kansas before you start, any of the numerous routes that cross these states and tap the Rocky mountains should be in condition for motoring by June 1. The several trans-state highways across Nebraska and Kansas are about of equal merit. You have an option of traveling the Lincoln highway or the Omaha-Lincoln-Denver road across Nebraska, and in Kansas there are four main highways that will take you into Colorado; the Pike's Peak highway, the Red Line route, the Golden Belt route and the Santa Fe trail.

You have mapped out a trip that should prove ideal. On your westward journey, you will have an opportunity to explore the southwest and visit the Pueblos and cliff dwellings in the vicinity of Santa Fe, the Painted Desert, the Petrified Forest and the Grand Canyon of the Colorado. On your return, via the Northwest trail, there are three national parks where you will probably stop: Rainier, Glacier and Yellowstone.

You are very fortunate that you can spend as much time on the road as you plan, for by following the routes which you

Unsigned Communications

No communications not signed with the reader's full name and address will be answered. We have in hand unsigned communications from the following:

Chicago.....L. M. J.
Crawfordsville, Ind.....A. M.

These will not be answered until the full names of the writers are sent in.

outline you will be able to visit the places most worth while.

You can secure copies of "The Tourist's California" and "Our Unknown Southwest" by writing to McClurg's, Chicago.

We have not been informed that the desert between Yuma and San Diego has been planked but do not think that it has. However, the terrors of desert travel in the southwest have been greatly exaggerated.

Winter Haven, Fla.-Akron, O.

Winter Haven, Fla.—Editor Motor Age—Kindly give me a routing from Winter Haven, Fla., to Akron, O., by way of Nashville, Tenn., Indianapolis, Ind., and Columbus, O., with the best roads.—R. L. Deal.

Route first to Mango, 47 miles, via Bartow and Plant City; thence to Gainesville, 173 miles, through Greer, Dade City, Trilby, Brooksville, Iverness and Ocala; and via Hague, Alachua, Fort White, Branford, and O'Brien to Live Oak; and on through Falmouth, Ellaville, Lee to Valdosta.

Crossing the state of Georgia, the route is first to Macon, 149 miles, through Vienna, Sibley, Sycamore, Chula, Tifton, Lenox, Adel, Mineola, Valdosta; thence to Atlanta by way of Forsyth, Barnesville, Orchard Hill, Griffin, Orr's Station, Atlanta. A run of 127 miles through Marietta, Cartersville, Adairsville, Calhoun, Dalton, Ringgold, crossing into Tennessee and entering Chattanooga.

Tennessee is next crossed, and the first section to Nashville, 143 miles, is through Sequatchie, Monteagle, Pelham, Manchester, Murfreesboro, and La Vergne. Nashville to Louisville, Ky., 205 miles, is via Gallatin, Bethpage, Sugar Grove, crossing the state line into Kentucky and going through Scottsville, Cedar Springs, Glasgow, Cave City, Bear Wallow, Buffalo, New Haven, Bardstown, Mt. Washington, Louisville.

Drive 124 miles north to Indianapolis, passing New Albany, Scottsburg, Uniontown, Seymour, Columbus, Taylorville, and Franklin.

Turning east on the National Old Trails road route to Columbus, O., over good gravel or macadam, through Greenfield, Cambridge City, Rio Grande, Gettysburgh, Vandalia, Springfield, Vienna, and Alton. Drive 55 miles to Zanesville on this same highway through Reynoldsburg, Herbon, Linnville and Mt. Sterling.

At Zanesville turn north going to Akron, O., 124 miles, via Dresden, Coshocton, Port Washington, Tuscarawas, New Philadelphia, Canal Dover, Navarre, Canton, New Berlin, Uniontown, and Springville.

Volumes 3 and 4 of the Blue Book give complete running directions. Price \$2.50 per volume; the Blue Book Publishing Co., Chicago.

Davenport, Ia.-Kansas City, Mo.

Chicago—Editor Motor Age—I expect to drive from Chicago to Kansas City, Mo. I am familiar with the road to Davenport, Ia., but desire to know the road conditions from Davenport to Kansas City, and the best way.—Miles Morgan.

Going over the Great White Way from Davenport to Des Moines, which road is one of the fastest across Iowa, route through Muscatine, Columbus City, Washington, Oskaloosa, Pella, Prairie City, Des Moines; then the Inter-State trail through Medora, Osceola, Lamoni, Bethany, Albany, King City, St. Joseph, Dearborn, and Smithville to Kansas City; total distance, 453 miles.

An excellent alternate with considerably less mileage is over the Chicago, Kansas City and Gulf highway, going from Davenport west through Wilton Junction, West Liberty, Iowa City; thence in a southwesterly course direct to Kansas City through Washington, Ottumwa, Centerville, Powersville, Chillicothe, Cowgill, Excelsior Springs, Liberty, Kansas City; total distance 394 miles.

Iowa Road Conditions

Iowa City, Ia.—Editor Motor Age—At this time, March 27, Iowa roads are in fair condition generally for motoring. Some spots are a trifle soft and spongy, but the average are fair to good. The roads are being dragged. Rains will help to pack and harden the surface, then the dragging will place the roads in fine condition.

The drainage of Iowa roads is far superior to conditions at this same time in 1914. Thanks to the new road law and the efforts of the Iowa highway commission and those boards of supervisors and county engineers who took advantage of the law to make the highways better and improve the drainage facilities.—Robert N. Carson.

Wyoming Motorist Gives Information About Yellowstone Park Routes

Evanston, Wyo.—Editor Motor Age—In a recent issue of Motor Age and also the issue for the 25th inst. routes are given to Yellowstone park for cross-country tourists, that is, from Cheyenne to the Yellowstone park and then the route retraced to Cheyenne and on westwards. Also Motor Age stated in its last issue that April 15 is too early to cross this state.

The road has been open from here east across the state for some weeks and the week of March 21-27 we had two cars come here from Salt Lake, via Ogden; in another 10 days the bad places will be all dried up. We are having an earlier spring than usual.

Regarding the Yellowstone park trip you advise, the disadvantage of that route is that the roads across the interior part of the state are entirely unimproved. I have driven them, and until the park is opened to tourists, they are obliged to retrace their steps to Cheyenne, making a trip of about 1,000 miles and then they are at their starting point, Cheyenne.

We have tried to get roads opened to the park going north from Rock Springs but until the Hoback canyon is improved that

is entirely impracticable, as about 12 miles of the canyon is impassable and no way of getting through. During the last weeks of last October I drove from here all through southern Idaho and back, a pleasure trip, and I believe I have found a Yellowstone park route that we can recommend to the tourists and which will not cause them to have to retrace their steps to any considerable distance.

A large amount of work is contemplated along the Oregon Shortline from Grange to Montpelier, Idaho, this summer, but until that is done, a good route is as follows:

Lincoln highway to Evanston, Wyo., thence: Evanston to Randolph, Utah, 32 miles, graded road, Randolph to Laketown, good road, Laketown to Montpelier, Idaho, graded road along shores of Bear lake, 89.1, thence Soda Springs, 117.5, McCammon, Pocatello, 190, Idaho Falls, 246.4, St. Anthony, 291, thence to Yellowstone station, west side of Yellowstone park; I have not the mileage, but it is about a 6-hour trip. The mileages above given are from Evanston. The road from Montpelier is good to Soda Springs, level gravel, thence winding road along can-

yon to McCammon but considerably traveled and well kept up. From there to the park is an excellent road all the way.

Leaving the park the tourist would retrace to Pocatello, thence Pocatello to Twin Falls, Idaho, 136, thence south to Wells, Nevada, a 7 to 8-hour ride, mileage 126.8, and thence proceed south to Ely on the Lincoln highway or westward to Reno, on the Lincoln highway.

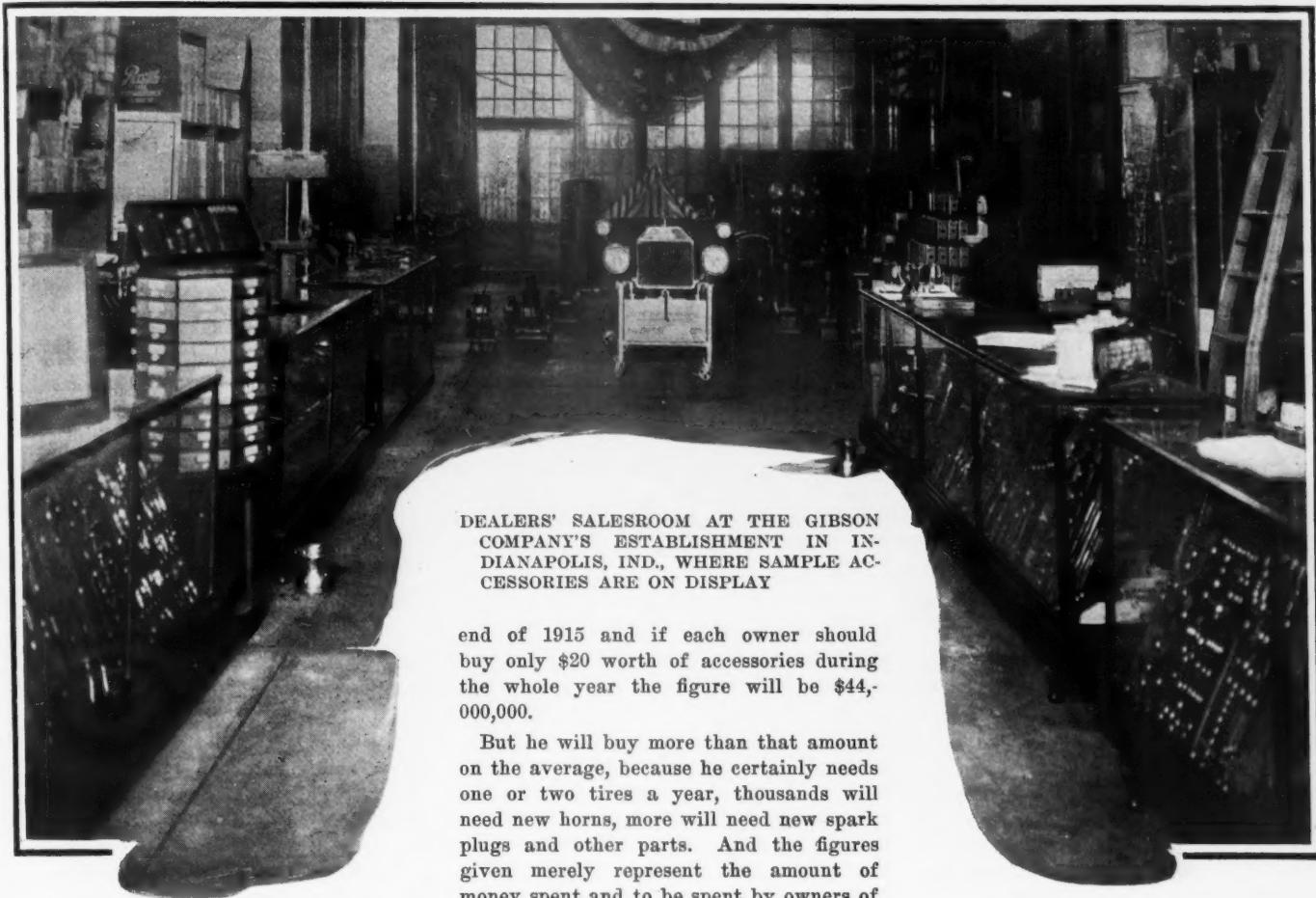
You will thus see that the side trip to the park does not mean retracing the entire distance of the side trip but that the tourist can go on towards the west while returning from the park.

Should the tourist desire to see Salt Lake or Ogden, they can go from here down and then from Ogden to Pocatello, good roads, and about 150 miles distance.

Idaho is well settled, a great many cars owned there and used and the roads are well kept up. Those around Pocatello, Idaho Falls and St. Anthony are considered excellent on account of the gravel formation of the country. The trip along Bear lake, some 30 miles, is excellent scenery.—P. W. Spaulding.

Accessory Business One of Giants of the Industry

System Necessary to Meet Growing Demands of Motorists—How the Gibson Company of Indianapolis Handles Wholesale Orders



DEALERS' SALESROOM AT THE GIBSON COMPANY'S ESTABLISHMENT IN INDIANAPOLIS, IND., WHERE SAMPLE ACCESSORIES ARE ON DISPLAY

end of 1915 and if each owner should buy only \$20 worth of accessories during the whole year the figure will be \$44,000,000.

But he will buy more than that amount on the average, because he certainly needs one or two tires a year, thousands will need new horns, more will need new spark plugs and other parts. And the figures given merely represent the amount of money spent and to be spent by owners of cars.

Size of the Industry

One can easily see the size of the accessory business, when the car manufacturer is taken into consideration. The maker sends his cars from the factory with a few hundred dollars worth of fitments such as top, windshield, lamps, etc., and assuming that each maker spends an average of \$100 for equipment of each car,

there is another figure of about \$50,000,000 to be added.

Where do these accessories come from and how do they get to the ultimate consumer—the car owner? These are questions often asked by those who support this enormous accessory business. As with all manufactured articles they have a beginning and an end, the former the factory in which they are made and the latter the ultimate consumer.

Handlers of Accessories

In the accessory business we have a string of factories at one end and the motor car owners at the other. Between the two are those who handle the accessories—wholesalers, distributors, jobbers and dealers.

The diagram on this page brings this out more clearly. Here is shown the accessory manufacturers feeding

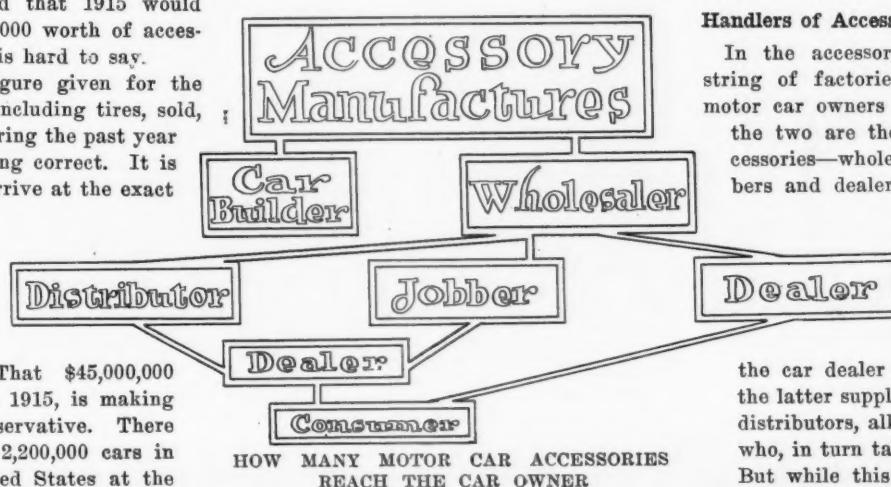
the car dealer and the wholesaler and the latter supplying dealers, jobbers and distributors, all over the United States, who, in turn take care of the consumer. But while this arrangement shows the

HAD some prophet made the statement in 1905 that the year 1914 would see about \$25,000,000 worth of motor car accessories sold to car owners in the United States, there is little doubt but that he would have been ridiculed or perhaps passed to the lunacy commission for a thorough examination.

Extent of 1915 Business Prophesied

What would have happened to this prognosticator had he said that 1915 would see more than \$45,000,000 worth of accessories sold to owners, is hard to say.

At any rate, the figure given for the value of car fitments including tires, sold, only to car owners, during the past year comes pretty near being correct. It is almost impossible to arrive at the exact figure because of the large number of concerns involved in supplying more than 1,750,000 car owners, the number registered last year. That \$45,000,000 worth will be sold in 1915, is making the estimate conservative. There should be more than 2,200,000 cars in operation in the United States at the





PORTION OF THE ACCOUNTING DEPARTMENT OF THE GIBSON COMPANY, WHERE ORDERS ARE CHECKED, ENTERED AND PASSED TO THE CREDIT MANAGER

path of many accessories there are others which are more direct. For example, the wholesaler may be a manufacturer, distributor and jobber as is the case with one of the largest accessory houses in this country, the Gibson Company, Indianapolis, Ind.

Some Control Factory Outputs

Some concerns besides acting as the above are dealers as well. The concern mentioned not only buys accessories of specialists but controls factory outputs in two ways—one by owning the factory and another by contracting to purchase the entire yearly output. The manufacturer also may sell directly to the distributor, jobber or dealer and in this case the wholesaler is eliminated. This is true in a number of cases.

The distributor handles various products and has the exclusive selling rights in certain territory. A distributor in Indianapolis for example, may have as his territory, for certain accessories all of Indiana, some counties in Illinois, all of Ohio, Kentucky, Virginia, North and South Carolina. He distributes the products through this territory through dealers who in turn sell to the consumer.

On the other hand, there is the jobber, to whom the wholesaler must sell. It is hard to draw a line of demarcation between a jobber and distributor, the former usually being referred to as one without exclusive selling rights, although he may have a restricted territory in which to sell certain fitments. His name was given to him because originally this type of merchant bought his goods in job lots or large lots. The jobber must sell to dealers within the small territory usually allotted to him.

In the third division to which the wholesaler sells we find the dealer. He sells to the motor car owner directly, as the chart shows.

It becomes quite clear that there is a great burden thrust upon the wholesaler and his methods of developing business and his system of handling it is quite interesting.

In order to do a successful wholesale accessory business a concern must have the proper type of buying staff. It has become almost general with large wholesalers of accessories to have an engineer to work in conjunction with the regular purchasing agent so that the goods handled will have a very small percentage of returns.

Many Fitments First Tested

When, for example, a new factory brings out a lubricating oil which it desires to sell to the wholesaler, the latter does not merely ask the price. In fact, his first move is to find out how the oil compares

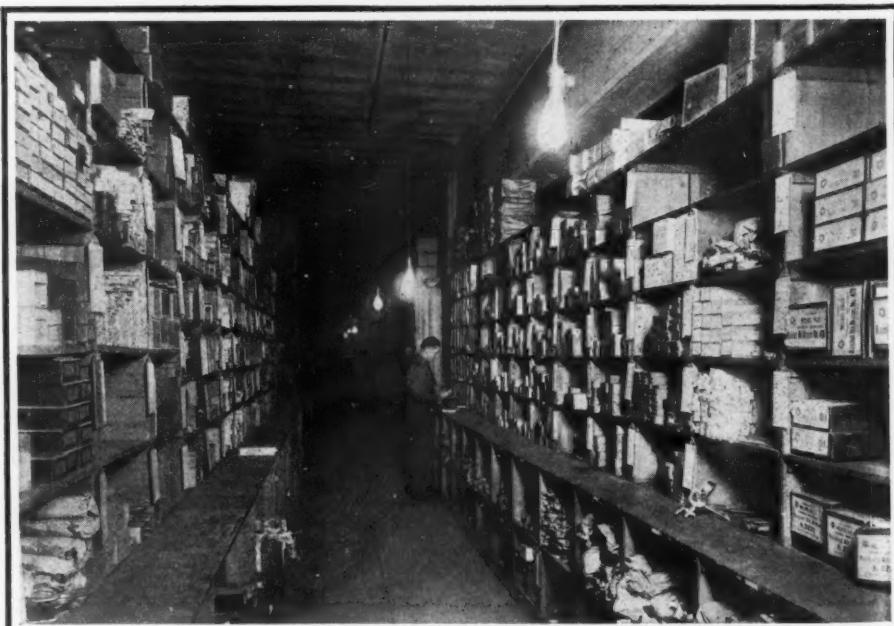
with others already being handled. To do this intelligently tests are conducted. In the case of the Gibson company, the oil before it is bought is tested in three ways. First a chemical analysis is made. Samples of the oil are sent to various car makers for trial. The third test consists of one on the road in one of the company's cars and the actions carefully watched.

In this way it can be determined whether or not the oil is worth while buying. If it passes, then the price is considered. Lubricating oil is not the only product which receives a thorough test. A new shock absorber may not be purchased on its looks or price. It may be given a bench test in the concern's laboratory and road tested for perhaps 2 months before it is purchased.

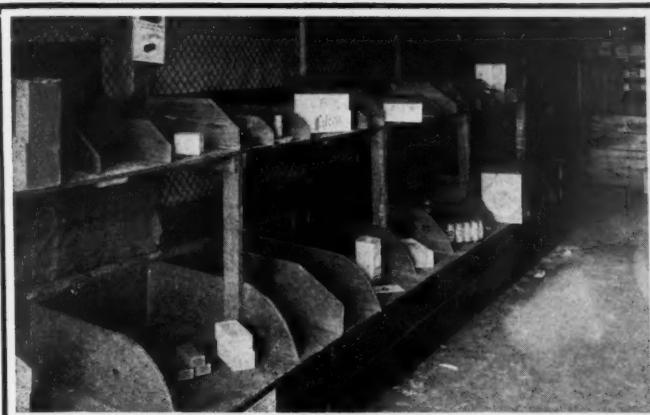
Large Quantities Bought

The purchasing agent of a wholesale accessory house can bankrupt the concern in one season, if he buys poorly. A wholesaler naturally must buy accessories in large quantities, the volume depending upon a number of factories, mainly, the demand, the seasonability, the efficiency of the articles, the price, the competition in the field, the rate at which new cars are being sold, etc. As an example of quantity buying, the Gibson Company purchased last year about sixty carloads of dry cells. This is about 1,000,000 cells, and in purchasing this quantity a number of things had to be considered, such as number of cars using dry cells, the frequency with which new cells are bought, the number of new cars being marketed which use dry cells, etc.

This is but one instance of buying in quantities. The same may be said of horns, bumpers, spark plugs and other fitments. After the accessories have been shipped from the specialist's factory or the con-



HOW STOCK IS KEPT IN A LARGE ACCESSORY WAREHOUSE. THE SMALL CARDS AT EACH BIN HAVE A COMPLETE RECORD OF THE MATERIAL WITHIN



UPPER — BINS IN WHICH THE PARTS OF AN ORDER ARE COLLECTED PREPARATORY TO PACKING AND SHIPPING

LOWER—SHOWING HOW HEAVY MATERIALS SUCH AS BARRELS OF DRY CELLS ARE KEPT ON THE FLOOR AND THE LIGHTER, BOXED ACCESSORIES PLACED IN BINS



cern's own factory, a suitable warehouse must receive them. It is quite evident that a large establishment is necessary. In the case of the Gibson company there are two buildings, one a four-story warehouse for surplus stock, and the other a three-story building containing the shipping room and the rapidly moving stock, together with the main offices. These buildings must have on hand all the time about \$750,000 worth of stock in order to supply the various distributors and jobbers, for these also buy in comparatively large quantities. The jobber buys a lot of accessories outright and either keeps them in his warehouse or in the wholesaler's. The dealers in turn buy the accessories in small quantities and sell them to the consumer in that way.

The Question of Price

It may appear from the foregoing that an article sold to the consumer who deals directly with the wholesaler, will have a lower selling price than that sold from dealers who buy through distributors or jobbers. This is not the case, however. The dealer's profit on a spark plug is the same whether he buys from a distributor or directly from a manufacturer. The price to the jobber and distributor is lower than that to the dealer, for the reason that these men buy in quantities.

When the wholesaler sells directly to the dealer, there is a saving made by the former, because the price is higher on small-quantity sales, just as it is in all lines of trade. So, when the motor car owner buys his accessories of one dealer the profit is the same as if it were purchased of any other dealer handling the same article. In cases where the dealer undersells his competitor, he must sacrifice some of his own profit.

The large accessory concerns in this country develop their business by means of road salesmen and advertising. The latter may be subdivided into newspaper and magazine advertising and circularizing. A representative method of handling men to cover the country and keeping in touch with the various dealers, distributors and jobbers, getting new customers, etc., is that employed by The Gibson Company. This concern has eighteen salesmen, each one traversing a certain portion of the

United States. At the same time it has foreign representatives.

The salesmen who operate near the home office use Overland roadsters to travel from place to place. There are twelve of these men. They go over their entire territory visiting every customer in it and at the same time trying to get new ones. Should the salesman be far from the home office, the railroads are used.

These salesmen are stimulated by a bonus system, under which a salesman can increase his earnings to an unlimited amount. For example, should his normal amount of business be \$60,000 a year and be increased to \$70,000 he will get a certain bonus, perhaps \$300. If his business is \$80,000, he gets still more. In other words the more business he turns in the greater his share of the profits. At the same time, he gets a prize every month, for doing the greatest amount of business with the least amount of money. This is done to keep expense accounts down.

Other Salesmen's Bonuses

Another prize is offered to the salesman turning the most business regardless of the expense account. In all of these, there are second and third prizes also.

Each day the salesman is required to fill out a blank form on which are spaces for the towns he has visited that day, the dealers interviewed, whether or not business was done, the approximate amount of the sale and then in the last column remarks. For this a code is used so that a great deal may be said in little space. For example: "D" "N" "V" may mean "Buyer is away, send him a catalog, for I believe him to be a fairly good prospect."

At the bottom of this sheet the sales-

man makes notation concerning his plans for the next day, or week perhaps, giving his mail and telegraph address if possible. With this sheet filled out and in the hands of the sales manager, the latter knows exactly what that man has done during the day. But the work does not end here. This daily report is transferred to a blue card or town record which gives the name of every dealer in the town indicated on the card, his rating by a commercial agency and his record. This is placed in narrow columns at the right and consists of information concerning every visit made to the dealer in the town, the date and the classification under which he comes. He may be a Ford dealer, for example. With this card filed, the sales manager knows at all times just how much business he is getting from each town and dealer in it and the periodicity with which the salesman calls in that town. If a town of 20,000 persons with 1,000 cars only brought \$3,000 worth of business, it means some of the dealers there need attention. The salesman is notified and he gets after the dealers who have not done much business with the company.

Another Carding System

Each dealer is carded in another way in order to keep track of the business done with him. In this system the card tells the total amount of business done for the past 2 years and also itemizes the business done for the present year. If the average is low for the present period the salesman in that territory is notified to get after the dealer.

While all this is going on business is stimulated in another way. Every week the concern sends out circulars of some sort. In December, a little booklet containing winter accessories, will be sent out.

This will bring to the dealer's mind just what he needs for those customers who use their cars all the year round. The regular weekly circulars may show special prices on certain articles, or they may illustrate new goods. At the beginning of the year a large 320-page catalog is sent out to all customers. Two men are used all the year round to get this catalog in shape.

In order to ascertain just how to handle a dealer, the concern has another carding system. As soon as a salesman starts to visit a dealer, that dealer is carded whether he is sold or not. The first information the company receives about a dealer is listed on the white blank which tells the dealer's name, rating, etc. This white slip is

given one of three classifications, productive, non-productive or prospective. If the customer is sold he immediately becomes productive and the white slip then is placed in front of a yellow card, which is marked "Productive" on the index. If the chances for selling the man are good, he becomes a prospective and the white slip is placed in front of a blue card indexed accordingly. However, if the salesman cannot get this man interested he is neither prospective nor productive, but non-productive and the white slip with the information concerning the dealer is placed before a red card marked "Non-Productive." As soon as a slip is filled out and the index filed, the salesman is given a

and at the same time the Addressograph company is given a blue slip, from which to make an addressing plate. This is used in addressing literature to be sent to the dealer, should he be in any of the three classifications named.

This really forms a small index in itself and the whole is filed in a unit in a drawer with other such units. Checking this file tells the sales manager immediately all those on the mailing list which are productive, non-productive or prospective. If the dealer should remain prospective or non-productive for a while and then give an order for goods, a notation is made the day he becomes productive. This is down on the white slip as shown.

Sheet Steel Used Extensively in New Able Motor Cylinders Practically the Only Cast-Iron Parts

SHEET steel is a rather new material as an ingredient for motor car engines, yet this is a component to a great extent of the Able engine, which has been produced by the Able Motor Co., New York. The idea of the design is to turn out an engine that will suit users who want comparatively small power at a very low price. The engine has a bore of 2½ inches and a stroke of 4 inches. Low weight also is one of the points desired, with a reasonable amount of power in proportion to the weight and cylinder dimensions. The official rating gives the motor 17 horsepower at 1,000 feet per minute piston speed, but we are informed that the experimental motor has developed 22 horsepower, which can be considered good for an engine of only 86 cubic inches piston displacement.

As much as possible has been done to eliminate work on the parts, and there is only one heavy piece, this being the cylinder block. This is shown in Fig. 1 and

contains all the cast iron in the engine; in fact, there are only two other cast parts, barring the pistons.

To support the two-bearing crankshaft, malleable brackets are bolted to the cylinders by a pair of bolts each, this being lighter and cheaper than casting hangers and cylinders in one piece—lighter because the malleable is stronger than plain cast iron, and cheaper because the machining of the cylinders and the hangers is rendered easier by the separation of parts. For the crank a drop forging in a good steel, with tensile strength of 80,000 pounds, is used and the two bearings are Hyatt rollers of the self-contained journal pattern. Each bearing is pushed on the crankshaft and the housing placed over it before the bolting to the cylinders takes place.

Also the rear end bearing and hanger are mounted before the flywheel is put on, since the latter is merely a tight fit on the crank and is not held in any other way. The two camshafts are carried in the crankshaft hangers and assemble with the crank. The illustrations make clear the way in which the whole of the crankcase is bent up from a single piece of sheet steel, with the oil trough spanned out in a separate piece pushed inside. The oil pump is a simple barrel containing a spring backed plunger, and since the barrel has a collar at the foot it has merely to be pushed up into the hole drilled for it in the cylinder foot, and the pressure of the actuating cam then keeps the barrel in place as well as holding up the plunger, thus eliminating any screws.

Pressed sheet steel is used for the timing gear cover, the two pieces being overlapped just as the crankcase overlaps the cylinder block, and it is claimed that the width of the lap in each case is enough to retain all lubricant without any packing or gaskets. There are only two thumb screws to secure the lower part of the crankcase, and the upper portion is held on by a small number of screws.

For mounting the motor in the chassis, brackets of any kind can be bolted to either end of the cylinders. For ignition the standard fitting is a timer placed horizontally at the front end of one camshaft, but a special front hanger is made with an extra pinion carriage, so that a magneto can be mounted, as shown.

There are light connecting rods, and the pistons are also low in weight, while they have a feature claimed to eliminate slap. The wristpin is offset relative to the piston center line. This is done so that the explosion pressure may tend to tilt the piston in a direction opposite to that in which the angularity of the connecting rod tries to force it. A feature worthy of notice, though having little to do with the general scheme, is the intake arrangement. The intake passage is divided horizontally by a steel plate which is cast in position, the ends of the plate are clear of the ends of the passage, the carburetor feeds to the middle of the passage, beneath the dividing plate, and the valve ports open to the passage above the plate.

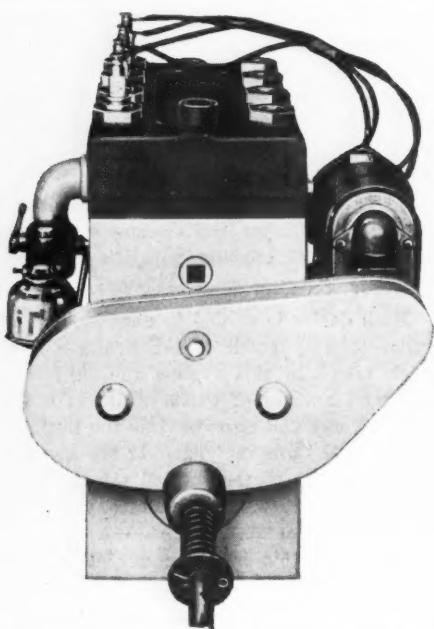


Fig. 1—Front view of the Able motor, which uses pressed-steel in many of its parts

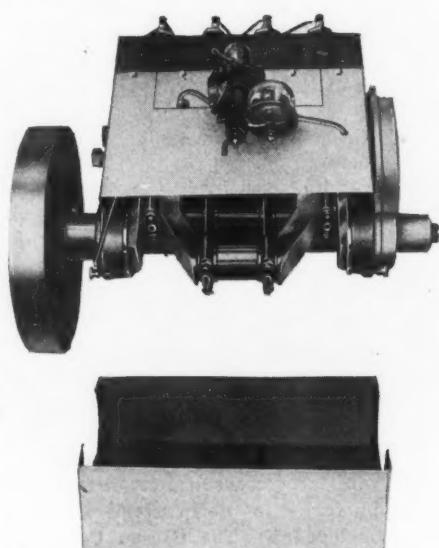


Fig. 2—Able motor with crankcase cover removed to show crankshaft

Dorris Brings Out a Model of Six Cylinders for 1916

Distinctive Valve-in-the-Head Motor, 4 by 5 Inches in Size

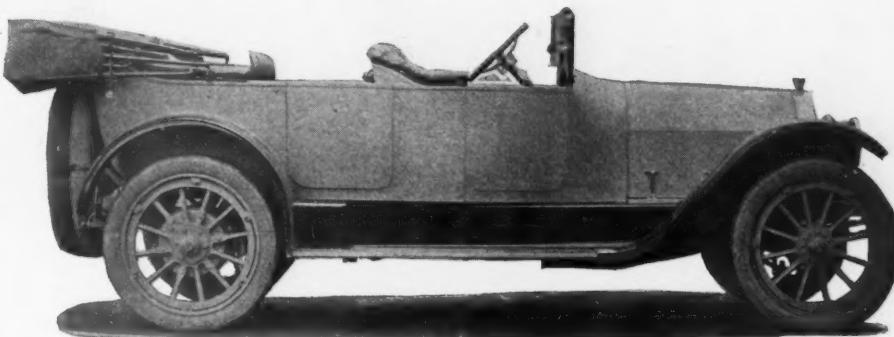
FEATURES OF THE NEW DORRIS SIX

General construction like the four
Valves in head completely inclosed
Rocker arms have ball joints
Novel oiling system for valve mechanism
Unique starter drive
Gasoline filler on floor boards
Centralized control unit

THE most recent convert to the six-cylinder motor is the Dorris Motor Car Co., of St. Louis, Mo., which announces that for 1916 it has a six that will sell for \$2,475 and in which will be incorporated the recognized features of the Dorris, which has always come out in four-cylinder form heretofore and which has been featured by an overhead-valve motor of the company's own design and construction. The new six, which has a bore of 4 inches and a stroke of 5, also is marked by a number of small refinements, although none of the originality of former designs has been sacrificed.

Valves Are Removable

Unlike many overhead-valve motors the valves in this new six are readily removable complete with their seatings, as the cages are screwed into the cylinder head. The cylinder head is bored out to receive the cages and the latter make contact with the walls of their containing chambers, so that heat is transferred to the main casting and thence to the waterjacket. The use of cages of the correct thickness and the provision of adequately cooled walls in close proximity is held to be an essential matter if an overhead-valve motor is to be successful since the cages are liable to give trouble if allowed any opportunity to overheat.



New Dorris six-cylinder model which is fitted with a distinctive overhead-valve motor. The price is \$2,475 for the seven-passenger

This appears to have been taken care of most efficiently in the Dorris construction. Instead of an overhead camshaft, the usual location is employed, the valves

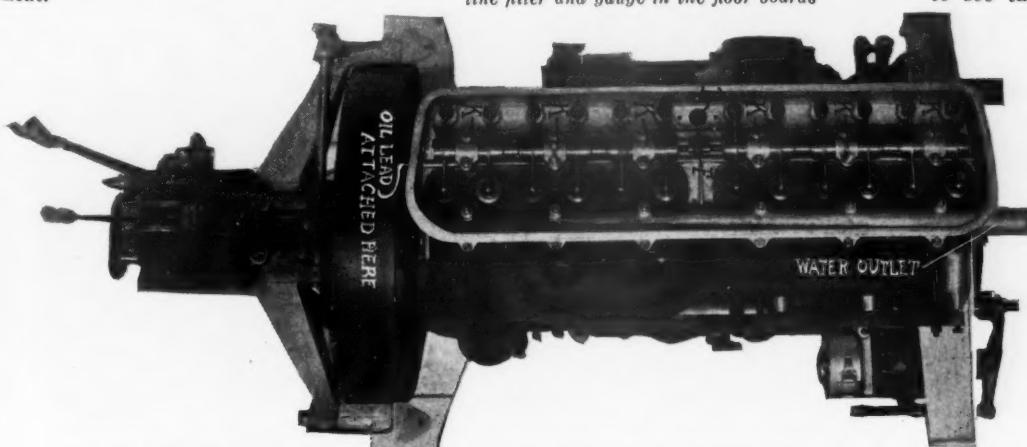
being operated by means of long pushrods and short rocker arms, the latter mounted on a hollow shaft that lies along the top of the cylinder block. Adjustment for valve-stem clearance is made on the pushrods, the detail of which appears in the illustration of the end view of the motor. At the upper end of each pushrod is a small cup, and the corresponding extremity of each rocker is cupped similarly, connection between the two parts being made by inserting a single steel ball of $\frac{1}{8}$ -inch diameter; this, it is claimed, ought to be better than a yoke and pin coupling, because it compensates for wear automatically, needs less lubrication and facilitates the removal of a valve. This last feature is obvious from the drawing, for it is only necessary to depress a valve by hand in order to free the pushrod and allow the rocker to drop out of the way of the cage as this is unscrewed.

Lubricating Valve Mechanism

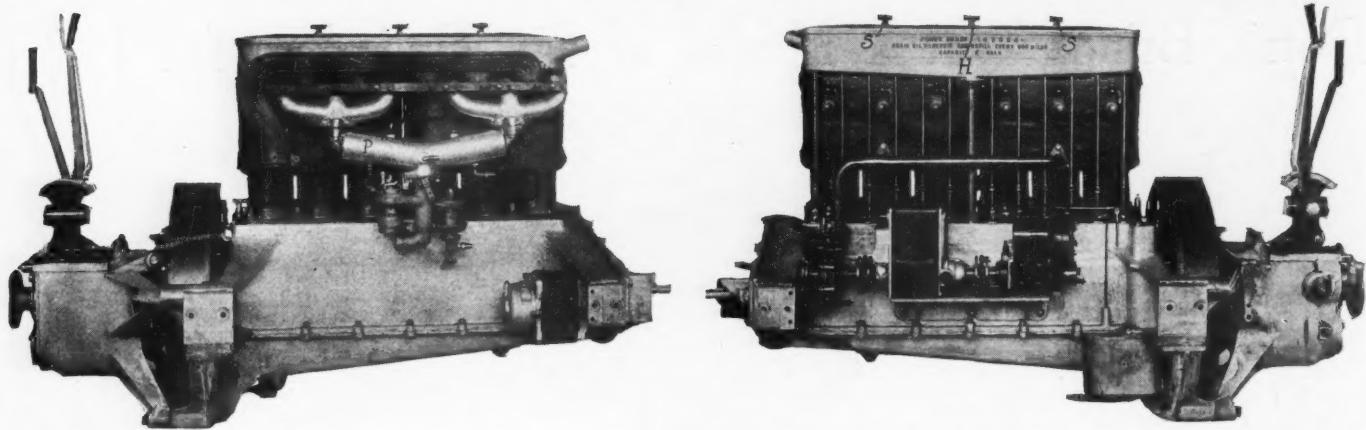
In lubricating the bearings of the rockers on the hollow shaft which carries them, it is highly desirable to prevent pools of oil collecting around the tops of the valve cages, because oil that gets down the valve stems in quantity is liable to produce quantities of carbon in awkward places. It is none the less necessary to see that the rockers always are free, since friction on their centers causes lag in the valve action and produces wear on every part of the valve operation. Oil is fed by the main gear pump, through a copper pipe and so to the inside of the hollow rocker shaft, whence it exudes within each rocker bushing. To catch the overflow the aluminum top piece which encloses the rockers has a ridge raised on its bottom and the floor beneath the rockers is sloped so that all oil drains towards the center. Here, as is shown in the plan view of the motor, is situated



Front compartment of the Dorris six, showing the ignition and light control unit and the gasoline filler and gauge in the floor boards



Top view of the Dorris six-cylinder motor, showing the clamps K for supporting the rocker arm pivot. Also notice the breather pipe B and the fence F, which prevents oil from getting to the valves



Left and right sides of the Dorris six-cylinder motor. Notice the unusual inlet manifold in the left illustration, also the single steel clamp for both inlet and exhaust manifolds. The right illustration shows the valve housing cover held down by screws S. H is a handle for making removal easy. Notice how the head slopes so as to drain oil toward the breather pipe

the breather orifice, so surplus lubricant passes directly back to the crankcase.

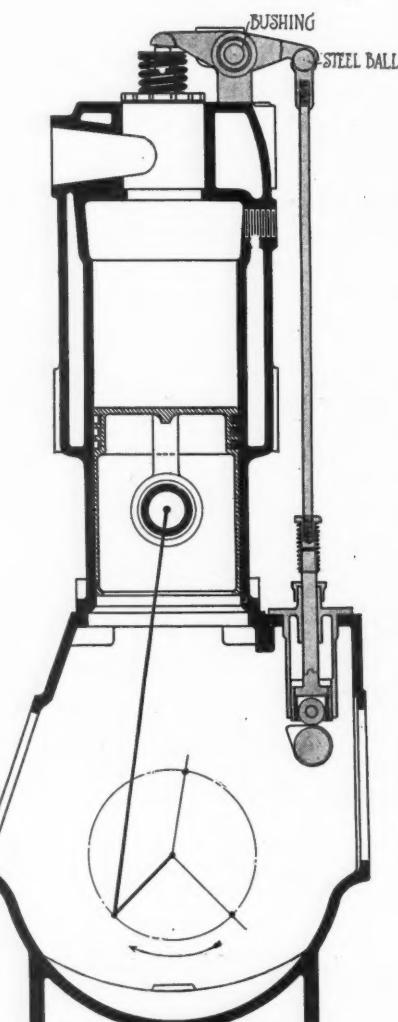
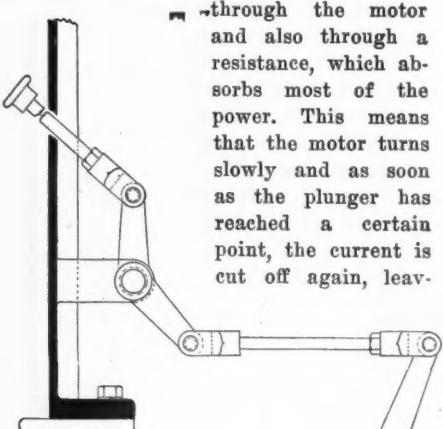
It also may be seen in the illustrations how the water outlet pipe is cleverly combined with the aluminum top piece. It should be noticed that this outlet lies alongside the valve cages, so insuring a free circulation at this most important part of the system.

Unusual Starter Drive

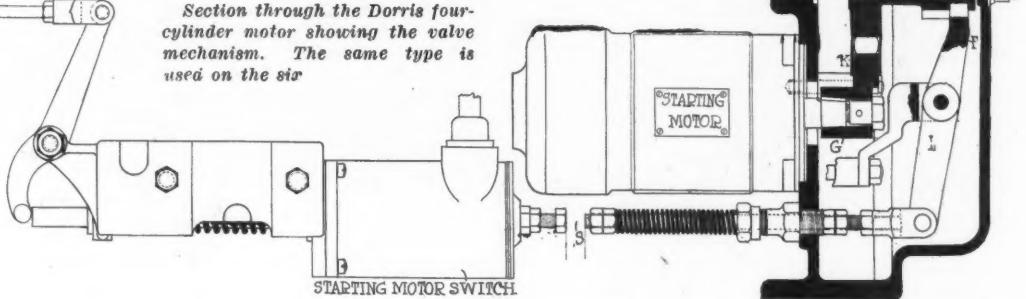
Instead of using the almost universal flywheel drive for the starting motor, the Dorris has a double reduction gear located in the timing case, giving a total ratio of 24 to 1 and operated by sliding the intermediate compound gear KM into mesh with a special gear N, mounted on the crankshaft just forward of the timing pinion. This construction is held to be neater than the flywheel drive in some ways and it ought to be quieter in operation, as the gears can be lubricated efficiently.

To mesh the gears the special form of Westinghouse motor switch is used, the operation being magnetic. Pressing the starting pedal causes current to pass

through the motor and also through a resistance, which absorbs most of the power. This means that the motor turns slowly and as soon as the plunger has reached a certain point, the current is cut off again, leav-



Section through the Dorris four-cylinder motor showing the valve mechanism. The same type is used on the six



Westinghouse starting installation on the Dorris, showing the motor gear G, which operates the compound gear K within which is a slipping clutch. N is the crankshaft gear. The operation of this system is explained in the text

ing the motor spinning gently. Continued pressure on the pedal takes up the space S and so pushes the starting gears into mesh, the slow turning of the motor making engagement easy, and the last stage of movement engages the main contacts and passes the full current into the motor. To prevent the motor being over-driven when the engine starts there is a roller clutch inside the large sliding gear and this, of course, overruns at the first explosion in the cylinders.

The Westinghouse generator is located on the right side of the engine, and has a magneto in tandem, connection being made through a leather coupling at either end of the armature shaft.

Seven-Bearing Crankshaft

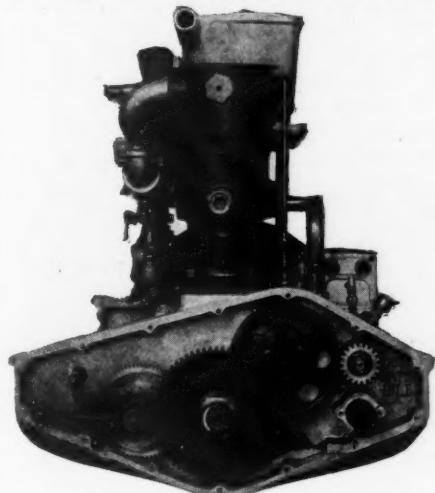
Again, contrary to usual practice, seven bearings are used for the crankshaft, this being thought to give the most rigid support possible. It should be observed that room has been found for bearings of good width without making the motor excessively long for a 4 by 5 six.

Both the intake and exhaust manifolds are rather different from standard ideas and it is to be observed that the gas is well warmed by an ample waterjacket round the main branch of the intake mani-

fold. The carburetor fitted is a Stromberg, which is rendered accessible by the absence of other fittings from that side.

In the illustration showing the magneto side of the motor the location of the oil pump can be seen, it being in the base and driven from the rear end of the camshaft. Lubrication for the crank and the other internal parts of the engine is by constant level splash, there being a gauge on the side of the crankcase and a drip indicator on the cowl board.

The motor is the most distinctive part of the Dorris chassis, but there are other



Front view of the Dorris six-cylinder motor, showing the timing gears and starting motor drive

parts that are a little different from the normal. For instance, the clutch is a special design of dry multiple-disk and

occupies the center of a fan flywheel, a form of draught-inducer that is highly uncommon on American chassis, though used a good deal in Europe. To allow this fan free action, it is necessary to give an ample space for air escape around it, so the three-speed gearset is attached to the motor by arms.

For the rear axle a Timken produce is used with spiral bevel drive and the usual brakes. There is nothing in the front axle or steering that calls for special comment. The Dorris is among the few which still pins its faith to a platform rear spring, the side members being 50 inches long and the cross spring 40 inches. The front springs are, of course, half elliptic.

A peculiar little detail that seems to make for convenience is the use of a cylindrical gasoline tank located beneath the driver's footboard and attached to the side of the frame. This placing enables the filler and a gasoline gauge to be arranged so that they stand almost flush with the board; the gauge can be seen at any time by glancing downward, and the filler is accessible by merely opening the side door. A Stewart vacuum feed is employed for raising the fuel.

Another important detail is that the dashboard is part of the chassis and carries all wiring, etc. The seven-passenger body simply drops in place over the dash, and all switch gear is contained in a box clamped to the foot of the steering post.

Body equipment is complete in all detail and includes a Golde one-man top, Stewart tire pump and 36 by 4½-inch tires; the wheelbase is 128 inches.

Remy Distributer for Eights Latest

J-M Power Tire Pump for Cars in Service

A SINGLE-CYLINDER tire pump, which though small and compact, is said to be capable of inflating a 34 by 4 tire in 2½ minutes and a 30 by 3½ in less than a minute, is among the latest products of the H. W. Johns-Manville Co., New York.

The pump is 3¾ inches high, 3 inches in diameter and weighs 4½ pounds; the bore is 2¼ inches and the stroke ½ inch. Cylinder, piston and base are of gray iron with the wearing surfaces ground; the connecting rod is of steel, and the piston packing is of an asbestos material.

To minimize heating the intake and outlet valves are made extra large. An automatic pressure relief valve is provided and this, blowing off at the pressure at which the tire is fully inflated, eliminates the necessity for a pressure gauge. Lubrication is effected by packing the pump with soft graphite grease, so that there is no liquid lubricant to work into the air.

At present the pump is supplied for installation on Fords, Overland models 79, 80; Buick models 24, 25, 36, 37 and 56, and all Reos except the late 1915 models. Brackets for other cars will be added. In-

stallation is simple, requiring no machine work and no readjustment of any part of the motor. A split gear is furnished, which is placed on the crankshaft of the motor and drives to a rear gear on the pump shaft. The pump gear slides into and out of mesh, a coil spring holding it normally out. The price of the pump complete with gears and air hose is \$7.50.

REMY EIGHT DISTRIBUTER

The Remy Electric Co., Anderson, Ind., has just announced an addition to its line of ignition equipment in the form of an eight-contact distributor for battery ignition on eight-cylinder motors. The Remy company has had this equipment ready for the market at the time of inrush of eight-cylinder cars, but no announcement has been made up to this time.

With the exception of a few improvements the equipment follows much the same design as Remy vertical ignition distributors for four and six-cylinder engines and may be had in three different forms. One form has the distributor mounted separately, a second has the dis-



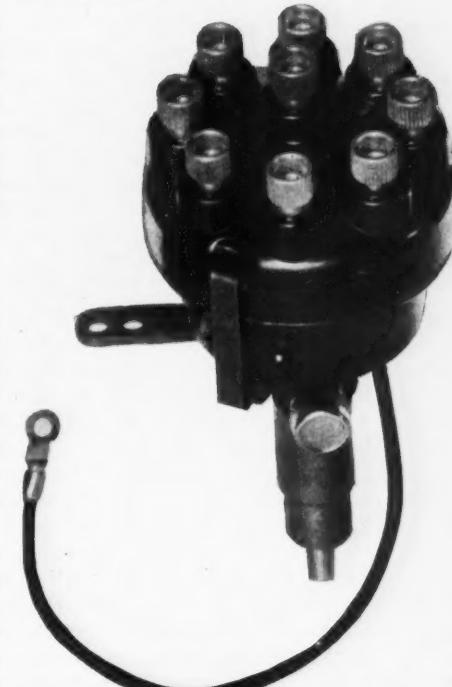
J-M power pump with split gear for quick installation

tributer mounted with the ignition coil upon a base for attaching to a magneto pad, and a third has the distributor integral with the generator. Any one of these forms may be had with either manual or automatic spark advance.

The distributor shaft has a very long bearing and a felt wick spring oil cup is provided for oiling. Another important feature which the Remy company calls attention to is that the advance and retard movement does not move or oscillate the distributor cap or the high-tension cables attached, thus eliminating chafing.

The Remy company further announces that it has under advanced construction an eight-cylinder magneto.

The coils supplied with the equipment are heavily impregnated and are inclosed in weatherproofed fiber tubes with Bakelite end pieces.



New Remy distributor for eight-cylinder engines

The Readers' Clearing House

NON-SUPPORT BY CAR BUILDERS Retailer Points Out Lack of Co-Operation by Vehicle Makers

VERMILION, S. D.—Editor Motor Age—In reading speeches and articles in motor papers, which were delivered at the several shows that have been taking place throughout this country, I note the one prevailing keynote, namely, "The great possibilities of this great middle west." In all these articles we get only one side of this case, that of the manufacturer and these same manufacturers that look to us, the small retail dealers, to deliver these same cars for them seem to have forgotten that we exist only to see that the cars are sold. It is about time that we get support in a different way than we have in the past, if they expect such wonderful things for this section of the country.

I have been in the motor car business since it began and my experiences have always been the same, which is as follows: Along about December the factory agents come along with this story: "You will have to take these cars in January and February if you want to have cars to sell when spring comes." This is all right if this same manufacturer would look a little to the interests of the local retail dealer, but what does he do? He gets this dealer to load up with cars, that is, those that will and can. This dealer who generally sells about twenty-five or thirty cars gets ten to twenty cars in his warehouse and along in May or June, just when the local retail dealer is getting his cars ready to move out to the farmers and everything looking to a big sale, this same manufacturer comes out in all the papers with an announcement of a new model with added improvements and, many times, price reductions. The answer to this is always the same, either this dealer goes broke in trying to dispose of these cars at the reduced price, or else it breeds price cutting and in this way kills the local trade or some other thing which gives the same bad results. It all sums up to this: the manufacturer either discontinues the yearly model plan or make this new model appear in January, so that the dealer that depends on the farmer trade for his living can get a whole summer's selling on the same model, or the manufacturers will lose some of the dealers, who refuse to do business for glory alone. The manufacturers will no doubt answer that it is the dealer's fault, that he can sell cars in the winter if he thinks he can. If that is so, as a thinker I am not a success. I would like to see these men that make this statement sell and deliver a car to a farmer when he is busy in the late fall with his corn or when there is 10 or 12 inches of snow on the ground. If anyone has done this, the

farmers are a different kind than we have here.

I am writing this because I think it about time that the retail dealer gets a little of the right kind of support from the manufacturer. The retail dealer has always been told what he had to do and made large deposits to see that he did it, with the result that the manufacturers cleaned up in good style, regardless in what condition is left the retail dealer.—M. L. Thompson.

BATTERY IGNITION FOR A FORD Six-Volt Accumulator Will Do the Work —Connections Simple

Independence, Cal.—Editor Motor Age—Kindly explain how to wire a 1913 Ford battery ignition. It is fitted with a Ford coil box.

2—On a 1912 Pope-Hartford fitted with a Gray & Davis two-unit starter, the current seems to be very high, which burns out the lamps rapidly. The ammeter used to register 7 to 8, whereas now it is 15, the limit of the ammeter. New storage batteries have been installed.—M. D. Hunter.

1—You can use either battery ignition alone or battery and magneto ignition on your Ford car. In connecting the battery, all that is necessary is to ground one side of the battery to the frame of the car and attach the other battery wire to the battery terminal of the coil box. The battery should be of about 6 volts.

2—Apparently the trouble is due to a worn governor. This is a lead weight governor and it is possible the weights have become loose. The trouble may be aggravated by poor operation of the slipping clutch. Motor Age does not advise you to attempt to repair the generator yourself, but to take it or send it to a Gray & Davis service station.

TROUBLE WITH A DISK CLUTCH Reader Cannot Prevent It from Spinning —Brake Suggested

Selma, Ala.—Editor Motor Age—Will you give me a remedy that will not cost too much for a Buick 26 1911 roadster that I am cutting down and which has a multiple disk clutch that will not turn loose no matter how far the clutch lever is thrown out? I have tried several mixtures of oil and kerosene, but that does not do any good. Does Motor Age think it advisable to file or grind the plates a little?

2—What speed should I get out of this car with a very light body and present stock gearing?

3—Considering that this motor is old, would it not be a good idea to use an oil with castor oil in it? We are agents for Cadillacs and carry Harris oils in stock. How much castor should I add to five gallons of Harris medium?—Walton LeGare.

If you cannot prevent the clutch from slipping by altering the adjustment or by using half kerosene and half oil, the best thing to do is to fit some form of clutch brake. One type which you might be able to install on your car is shown in Fig. 3. The clutch pedal lever can be fitted with a lever, the end of which has a block of wood attached. When the pedal is depressed the block of wood will rub against the clutch and tend to stop it from spinning.

2—It is impossible to tell what speed you will get out of the car.

3—If the cylinders are worn excessively it would be better to use a heavy oil instead of a mixture of castor oil and regular cylinder oil. The use of castor oil will tend to carbonize the cylinder rapidly.

CRANKSHAFT IS OUT OF ALIGNMENT

A New Shaft Is Best—Compression of Modern Motors

Goshen, Ind.—Editor Motor Age—After having cylinders reground and new pistons fitted, is it necessary to work them in by some other power? At what speed should the motor be run, and for how long?

2—Have modern motors a higher compression than the older ones?

3—Is the Ford a high compression motor when compared with other motors of its dimensions?

4—What is the compression of the 1914 Studebaker?

5—What is the cause of motors failing to pick up, misfire, etc., after slowing down for a short distance? Is this due mostly to the present low grade of gasoline condensing in the intake passages, and when the throttle is again opened this is rushed into the cylinders along with the constant spray from the jet, making the mixture too rich? What remedy would Motor Age suggest?

6—Tell how to pipe a model L Schebler carburetor for hot water on a Jackson 30 1911 Northway motor, thermo-syphon cooling. Also give plan for same style of motor which have pumps.

7—I have a four-cylinder motor which has a crankshaft which is slightly out of alignment, possibly three or four thousandths. Does Motor Age think it practical to use this shaft as it is, as I do not care to go to the expense of having the bearings turned up? The shaft has three bearings.—A Subscriber.

Why is it that buyers are so indifferent to the

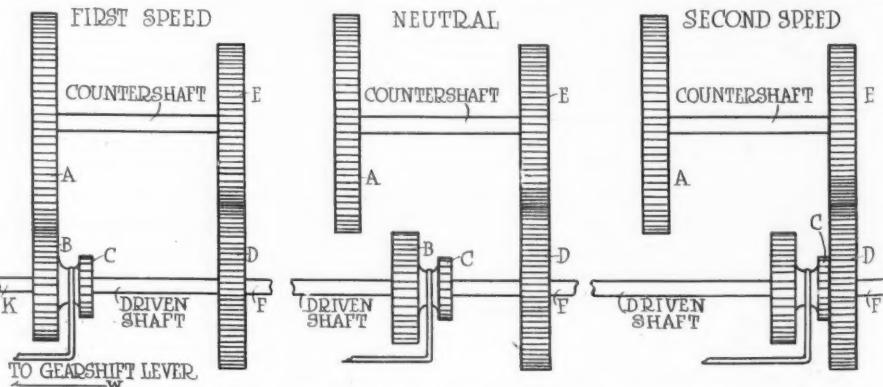


Fig. 1—Showing a simple two-speed gearset in its three positions—first speed, neutral and high. Its operation is explained in the text.

prices of replacement parts on cars which we think are just as important an item as the original purchase price? I would advise every purchaser to demand from the dealer a parts catalog and get the prices of some of the parts, and if the dealers will not produce one, demand one from the makers.

1—It is best to run-in the motor before allowing it to run on its power. A 6 to 12-hour run at about 350 r.p.m. will give good results.

2—In the early stages of development the motor car engines were of the high-compression type, but gradually the compression has been reduced so that the average motor of today operates with a compression pressure of between 65 and 75 pounds per square inch.

3—The compression pressure in the Ford motor is between 55 and 60 pounds per square inch.

4—About 65 pounds per square inch.

5—Quite often loading up of fuel in the inlet passages causes this condition, but more frequently poor carburetor adjustment. A carburetor, especially one with two jets, can be adjusted for quick pick up.

6—One of the water pipes from the carburetor should be tapped into the water system rather high and the other pipe should be attached at a low point in the systems. In a pump system one of the pipes should be led to a high point in the system and the other, the outlet, led to the pump.

7—If a crankshaft is out of alignment so that it is noticeable in engine operation, it will pay you to have the shaft repaired, if that is possible, or have a new shaft installed. You can overcome the difficulty for a while by taking up the mis-

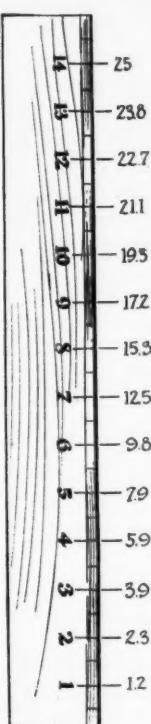


Fig. 2—Gauge for tank on a Buick

alignment in the bearings, but with the crankshaft itself sprung, the trouble will return.

PECULIAR TROUBLE WITH A FORD Says Gears Shift from High to Low on Rough Road

Free, Tex.—Editor Motor Age.—I have a Ford car which in going over rough roads jumps from high gear to low, and at other times on good roads the gears will shift the same way. I have tightened the three set screws as far as they will tighten, but this does not help the trouble. Do you think a new clutch spring would help? The car has been run about 20,000 miles. What is the trouble?—John M. Edwards.

We are at a loss to know what you mean by stating that the gears shift from high to low in going over rough roads.

While it is possible for the clutch to slip out, it would be impossible to change from high to low speed. Motor Age is inclined to believe that this trouble is due to wear in the clutch and if it cannot be properly adjusted by turning in the three set screws we would recommend that extra pair of clutch disks be installed.

INCREASED PRESSURE, MORE POWER More Speed Obtained but Motor Life Will Be Shortened

Grand Junction, Colo.—Editor Motor Age—I have just completed overhauling a model N Ford engine and by reducing the size of the combustion chamber, also applying leak-proof rings, I have increased the compression to about 65 pounds, the gauge showing this with a quick turn over by hand cranking.

In talking with one of the repairmen at a local garage, I mentioned the fact and expressed the belief that I had increased the power of my engine considerably, but he disagreed with me, saying that high compression was of no advantage except in using kerosene for fuel. Is this true?

In reducing the size of the combustion chamber, I merely made new valve caps for the openings of the exhaust valves and made them long enough to project down into the combustion chamber far enough to take up as much space as a $\frac{1}{8}$ -inch thick plate would occupy if riveted on the top of the piston.—F. W. Baum.

You are correct when you say that the increase in power is due to the increase in compression pressure. Up to a certain point, depending on the design and speed of the engine and the fuel used, an increase in compression will give added power, but may shorten its life.

WANTS PARTS OF THE ISOTTA CAR Agent in New York Suggested—700-Inch Races Are Few

Hutchinson, Minn.—Editor Motor Age—What is the piston displacement of the Isotta Fraschini car used in the last race held at Glendale, Cal.?

2—Where can parts for the Isotta car be obtained?

3—Is the factory still manufacturing these cars?

4—Can a car with a piston displacement of over 700 cubic inches be entered in any of the 1915 road races? If so, which ones?—C. Hanson.

1—Motor Age does not know the displacement of this car.

2—Isotta parts may be obtained of the Isotta Fraschini Motor Co., 1920 Broadway, New York.

3—Yes.

4—These cars would be eligible only for free-for-all races.

OPERATION OF TWO-SPEED GEARSET Simple Construction Used in This System of Power Transmission

Mount Vernon, S. D.—Editor Motor Age—Kindly explain the details and workings of the

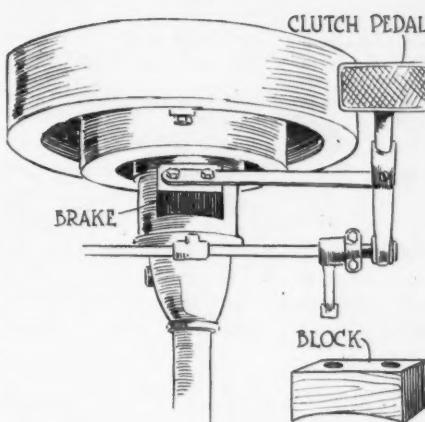


Fig. 3—Suggested clutch brake as a remedy for spinning

transmission with two-speeds forward and reverse.—J. T. Lowe.

An illustration showing the average type of two-speed gearset is shown in Fig. 1. It consists of two parallel shafts, one called the countershaft, which has two gears, A and E, rigidly fastened to it, and the driven shaft or shifter shaft, which has a compound sliding pinion, BC, operated by the shifter lever, and the gear D permanently attached. The gear has both external and internal teeth. The gear E on the countershaft always is in mesh with the gear D of the driven shaft, the latter gear operating the propeller shaft of the car, if the gearset is amidships. When the gear shifter lever is placed into first-speed position the sliding pinion BC is pulled back in the direction of arrow W, so that gear B meshes with gear A, and then the drive is from gear B through A to E and through D to the propeller shaft. When the gear shifter lever is placed in second or high speed, the gear C of the shifter pinion meshes with the internal teeth of the gear D, as shown in the illustration, and in this case the drive is direct.

Ruler Gasoline Gauge

Great Falls, Mont.—Editor Motor Age—I have a Buick roadster, the gasoline tank of which holds 25 gallons, and the dimensions of which are 35 inches long and 14 inches in diameter. How may I tell how much gas I have by measuring with a 15-inch rule?—F. Kerth.

The illustration in Fig. 2 shows a 15-inch rule properly marked to indicate the number of gallons in the tank at every inch from 1 to 14.

PREVENTS CHAFING OF THE TIRES Uses Section Cut from an Old Tire as the Proper Support

Pittsburgh, Pa.—Editor Motor Age—When tires are carried on the running boards or on tire holders, the constant movement of the car tends to cause the tire to rub against its supports. This constant rubbing may weaken the tire so that it soon will give way when it is put into actual use. Keeping the tire tightly strapped prevents the movement of the tire and, if the tire does not move, it will not chafe.

But the straps stretch gradually, so they should be tightened occasionally. The weight of demountable rims or wheels also

Questions Answered and Communications Received

M. L. Thompson	Vermilion, S. D.
M. D. Hunter	Independence, Cal.
Walton LeGare	Selma, Ala.
A Subscriber	Goshen, Ind.
P. S. Lewis	Gooding, Ida.
John M. Edwards	Free, Tex.
F. W. Baum	Grand Junction, Colo.
C. Hanson	Hutchinson, Minn.
J. T. Lowe	Mt. Vernon, S. D.
R. H. McAlister	Muncie, Ind.
Murray Fahnestock	Pittsburgh, Pa.
E. P. Gilmarin	Timber Lake, S. D.
D. F. Vaughan	Ottumwa, Ia.
Lee Young	Greenfield, Mo.
H. P. Davis	Elmira, N. Y.
A Reader	Gate City, Va.
R. C. Langley	Dallas, Tex.
R. Schlotz	Canton, O.
B. L. Hughes	Appalachian, N. Y.
W. R. Pennington	Ottawa, Kan.
R. W. Thoroughgood	Gainesville, Fla.
J. W. Robinson	Garrison, N. D.
O. Lindare	Mayville, N. D.
Newton Garage	Cody, Wyo.
G. T.	Stuart, Ia.
F. Kerth	Great Falls, Mont.
No communications not signed with the writer's full name and address will be answered.	

adds to the rubbing effect and it is a good plan to place a section, cut from an old tire casing between the tire and its supports, as shown in Fig. 4. This provides a resilient support and the wear comes on the old casing instead of on the new tire.

It also is a good plan to turn the tires, about once a month, in order to distribute and more nearly equalize the wear. The old section of the tire may come in very useful at some future time as a blow-out patch if nothing else is at hand.—Murray Fahnestock.

GEARBOX LOCATION IS DISCUSSED Advantages and Disadvantages of Three Different Positions

Timber Lake, S. D.—Editor Motor Age—The writer has heard many complaints regarding the gearbox on motor cars from users of cars having same in unit with the rear axle or differential, for the reason that the jar from the rear wheels in time causes the gears to become worn and loose. Will motor Age kindly give the advantages of the different types?—D. P. Gilmarin.

Engineers in favor of the rear axle construction state that this type is more quiet than the others, that the rear axle gearset unit, being heavier than the usual rear axle form, better traction is gained by the tires, which means less skidding. Further discussion brings forward that the rear axle gearset requires a number of long control rods, which the unit with motor and amidships construction does not call for. A longer drive shaft is possible when the gearset is a unit with the rear axle, which means that there is less strain on the universals, in the opinion of a number of engineers. According to another only one grease retaining reservoir is necessary and this statement is supplemented by another engineer to the effect that the grease contained in the case is not thinned by the heat of the motor or the muffler pipe. With the rear axle type the clutch is accessible usually. One engineer upholding the rear axle type claims that in a certain make the gears in the gearbox may be removed in a very short time and that the removal of the tonneau floor boards is no more difficult than the removal of the front floor boards. An advocate of unit with motor construction states that in his construction the entire gearset may be inspected and oiled without difficulty, whereas with the rear axle construction inspection is not easy and lubrication difficult. That the rear axle with gearset weighs more than other types, is brought forward, but is argued against by one maker who adds that his rear axle weighs but 20 pounds more in the rear than does the ordinary form of rear axle.

With the rear axle gearset the axle shafts must be heavy, which increases the weight on the tires, and it is stated this extra weight means greater tire wear. The statement is made that the rear axle type simplifies the chassis, but an opponent brings out that the control linkage is not simple and that the oscillation of the car springs is communicated to the sliding gears which result in indefinite gear location.

In order to determine the advantages or

disadvantages of a certain type of construction a definite example should be taken, for it is as much synthetic design of the car as a whole as it is the design of the gearset and its location.

ELECTROMAGNET FOR RECHARGING

Amount and Sizes of Wire for Charger—

Use of Dry Cells

Ottumwa, Ia.—Editor Motor Age—Kindly give the size and amount of wire, and diameter and length of iron core used in making an electromagnet which will give a 16-pound pull. Also give the amount of current needed when dry cells are used for the current source.

2—Will dry cells operate an electric cranking motor on a motor car, as well as storage batteries?

3—What steel would be best to be used in the frame of a racing car which carries a weight of 2,000 pounds?—D. F. Vaughan.

1—The strength of an electromagnet depends upon the number of ampere-turns, which means the number of turns of wire times the number of amperes drawn by the coils. The higher the ampere-turns the stronger will be the charging ability of the instrument. Motor Age has designed an electromagnet to operate at 6 volts, but never has made one from the plans and therefore does not know definitely how successful it will be. As calculated, the 6-volt instrument should use 300 feet of No. 13 B. & S. gauge, insulated wire, wound upon two, $\frac{1}{2}$ by 5-inch soft-iron cores. Such an instrument should give about 10,000 ampere-turns. If you are to use dry cells as the current source, the cells will have to be renewed frequently if much charging is to be done.

2—No. They have not sufficient current capacity and cannot be recharged.

3—A chrome-nickel steel frame properly heat treated, while expensive, would give better results than the ordinary hot-rolled, open-hearth steel with a carbon content of about .15 per cent.

MAXWELL CARBURETER OVERFLOWS

Trouble Probably Due to Float or Poorly Seating Float Valve

Greenfield, Mo.—Editor Motor Age—I have a Maxwell 25 with a Zenith carburetor which is giving trouble. When it stands for a time it overflows. I have tried adjusting the float, but with no good results. Would Motor Age suggest what the trouble is?

2—Is there any way to prevent the brake bands on this car from rattling? There seems to be no way to tighten them.

3—In what motor car concerns has Walter E. Flanders been connected?—Lee Young.

1—You may have thrown the float entirely out of adjustment by tinkering. The trouble, however, may be caused by an improperly seating float valve or a gaslogged float, more probably the former. This will mean the float valve must be removed and either reground to its seat or replaced with a new one.

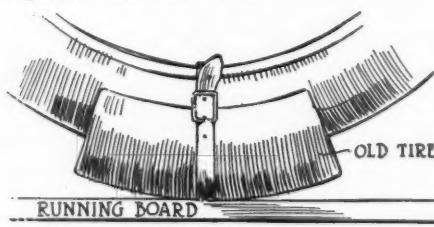


Fig. 4—How tire chafing may be prevented by using section of an old tire

2—If you will write to the Maxwell Motor Car Co., Detroit, Mich., it will send you gratis a set of springs and brake-band holders, which will eliminate your trouble. The model you have, no doubt, is one of the early ones, not fitted with these holders.

3—Mr. Flanders' career with motor-car manufacturers started with the Ford, after which he became affiliated with the E-M-F company, which later became known as the Studebaker. From this company he went to the Metzger Motor Car Co., which afterwards became known as the Everitt and later as the Flanders. From the Flanders he went to the Maxwell company and is with it now.

INTERCHANGING FRICTION DISKS

Method of Drive Suggested Would Have Too Great Wear

Elmira, N. Y.—Editor Motor Age—Could the driven and driving members of a friction transmission be reversed from the practice that is in general use, and could the fiber-faced driving ring be cut down to 7 or 8 inches in diameter with a proportionate reduction in size of the driven disk to drive a light car or cyclecar?—H. P. Davis.

The changes you speak of may be made but the results hardly would be as good as those obtained at present. There is no reason for interchanging the disks. It no doubt would be better to buy a new pair of friction disks for the smaller car.

CONSTRUCTION OF MAXWELL RACER

Is Design of the Chief Engineer of Detroit Factory

Gate City, Va.—Editor Motor Age—To whom do the Maxwell racers belong?

2—Who built the Maxwell racers and what did they cost?

3—Were they built in the Maxwell factory?

4—Is there any part of them that is similar to the Maxwell 25 touring car?

5—If not, what is the speed of the Maxwell 25 touring car?

6—Kindly give me the specifications of the Maxwell racers.—A Reader.

1—The Maxwell racing cars are owned by the Maxwell Motor Car Co., Detroit, Mich.

2—The cars were built under the supervision of Ray Harroun, chief engineer of the Maxwell company. Motor Age does not know the cost.

3—Yes.

4—The racing cars are entirely different from the Maxwell 25.

5—The model 25 is capable of traveling over 40 miles per hour.

6—A complete description of the new Maxwell racing cars was given in the March 25 issue of Motor Age.

DETAILS AND HISTORY OF BUICK BUG

Burman Established Two Records in Free-for-All Straightaway

Dallas, Tex.—Editor Motor Age—What is the size of the motor used in the Buick Bug racing car?

2—Kindly give the size of the valves and gear ratio of this car?

3—What is the best time ever made by this car? Who was the driver, and where?

4—Has any American car been built which beat this time? If so, how much and what car?

5—Did this car win third in the Grand Prix at Savannah a few years ago?—R. C. Langley.

1—The motor size of the Buick Bug is 6 by $5\frac{1}{4}$.

2—Motor Age does not know these figures.

3—The fastest time made by the Buick Bug was at Jacksonville, Fla., on March 28 and 30, 1911. Burman driving, established two records in the straightaway free-for-all. These records now stand and are 20 miles in 13:11.92 and the 50 miles in 35:52.31.

4—Many cars have beaten this time, but not in a free-for-all straightaway, regardless of class.

5—On November 12, 1910, in the Grand Prix at Savannah, third place was taken by Burman, driving a Marquette-Buick.

HARD STARTING OF POPE-HARTFORD Probably Due to Poor Adjustment of Interrupter Points

Canton, O.—Editor Motor Age—I have a Pope-Hartford with Atwater Kent ignition, but am unable to get an explosion in the engine. The wires are connected right and I have put gasoline in the cylinders. By pushing the spring switch in and out I can get an explosion occasionally. Will Motor Age explain why it will not start, and how I may start it?

2—Kindly explain the proper placing of the wires.—R. Schlett.

1—Your trouble in all probability is due to the interrupter points being too far apart. These points are in the distributor housing and by bringing them together just a little your hard starting troubles will vanish. However, pressure on the spring switch should always cause a spark to occur and an explosion, should the mixture in the cylinders be good. Be sure that the battery is up to capacity.

2—This was given in the January 21 issue of Motor Age, on page 78.

CANNOT START ON DRY CELLS Primary Batteries Are Designed for Other Service—Life of Storage Batteries

Ottawa, Kan.—Editor Motor Age—I have a Jackson 45 equipped with an Auto-Lite starter. The storage battery has been exhausted and cannot be recharged. Could the storage battery be replaced with dry cells using the same starting motor, generator and wires? How many dry cells would it require?

2—What is the life of the average storage battery when used for starting?—W. R. Pennington.

1—Dry cells cannot be used effectively for operating a starter.

2—A starting and lighting battery will last for 3 to 4 years, if properly cared for. Each year the battery will need new separators.

LIFE OF A SELECTIVE GEARSET Usually As Great As That of the Car— Air Starters

Gainesville, Fla.—Editor Motor Age—On removing the steering gear of my Carnation model C for inspection and oiling, I find that the key locking the worm to the steering shaft fits loosely, permitting the worm to be slipped up and down the shaft for a distance of about $\frac{1}{2}$ to $\frac{3}{4}$ inch before the key locks it from further motion. Is the looseness a matter of design or convenience in inserting the housing and for adjusting, or is it the result of poor fit or wear, and should the worm be rigidly keyed to the shaft at such a distance from the end to permit the shaft with attached worm to be screwed in to a proper footing for the shaft?

2—Are there any satisfactory compressed air starters of either the direct compression type or air motor type? About what is the cost of these and by whom are they made?

3—Under ordinary conditions, about what length of service in miles should the three-speed selective type of gearset give before needing

replacement or becoming excessively noisy?—R. W. Thoroughgood.

1—The worm should be rigidly fastened to the end of the steering post.

2—There are a number of successful air starters of both types on the market. Motor Age is sending you by mail a list of makers of these devices.

3—A gearset usually operates for more than 10,000 miles before it needs attention and many have been run more than this without requiring more than a change of oil.

WANTS TO MARK COUNTRY ROADS Suggested Scheme for Guiding Motor Car Tourists in Country

Garrison, N. D.—Editor Motor Age—Will Motor Age kindly give a cheap and practical method of marking country roads. Some of this country is not well developed and in places the roads angle, and other places follow section lines, so that in places it is very difficult to direct a stranger over some of these roads so that he will not have trouble.

If we had some simple way of marking these routes, I think we could get the drivers to contribute a day's time each and mark these various routes, if it could be done easily. Some of these distances are great and it would not be practical to set posts and expensive signs as we have no organization to carry out an elaborate scheme.

Could not these roads be marked with paint similar to the Yellowstone trail, Red trail, etc., without interfering or confusing drivers. We have telephone poles, fence posts and plenty of rocks where paint could be used effectually and cheaply.

Can Motor Age suggest a color scheme which might work out conveniently without confusing drivers. For instance, could we use a certain color of paint from one town to another or the same paint for a long distance connecting say two important towns, and then when the road branched off to some other series of towns or an inland postoffice or store, the color scheme might be changed?—J. W. Robinson.

The use of painted poles, rocks, etc., is being used successfully in New England and on roads in the middle west. There is an infinite number of color schemes you might use. For example, take a red background and between certain towns use this with one white stripe across; between other towns, two white stripes, and between two other towns, a white circle or square, etc.

WHEN IS A BATTERY WORN OUT? Needs Rebuilding When It Refuses to Take Its Regular Charge

Mayville, N. D.—Editor Motor Age—How may one tell when the storage battery is worn out?

2—Will a generator giving 5 amperes, charge two storage batteries of 6-volts each if two 15-candlepower bulbs and one 2-candlepower bulb be used about one-fourths of running time of generator?

3—Kindly give diagram of the Atwater Kent automatic spark advance.—O. Lindars.

1—A battery may be said to be worn out through service when the active material of the plates has fallen to the sediment trap at the bottom of the jars. A battery in such a condition will not take a charge and cannot possibly give service. A battery may be worn out prematurely by improper care and undercharging, causing the plates to lose the active material, buckle, etc.

2—if the generator is of between 12 and 16 volts the batteries may be charged in series and good results obtained, but if it is a 6-volt generator you will have to charge one battery at a time to get good results.

3—This was given in the January 21 issue of Motor Age, on page 78.

INTERESTED IN TURBINE ENGINES None Developed So Far Which Are Practicable for Motor Cars

Cody, Wyo.—Editor Motor Age—Was there ever a double-acting gasoline engine made which was practicable?

2—Has the double-action been tried in both two and four-cycle engines?

3—Have any patents been granted which would prevent other inventions?

4—Have any practical gas turbines been invented? If so, where can some information be obtained on these?—The Newton Garage.

1—Motor Age knows of no such motor.

2—Experiments have been conducted with this type of motor, but so far nothing practical has been evolved.

3—This will have to be taken up with a patent attorney or with the U. S. patent office.

4—Motor Age knows of no gasoline turbine engines which would be practical for motor car use, considering cost, etc. The Turbine Engine Mfg. Co., 69 W. Washington street, Chicago, has constructed a turbine engine and you may be able to get some information by writing to it.

DATA ON THE MODEL 17 BUICK Taxable Horsepower Based on the S. A. E. Rating Formula

Rating Formula

Muncie, Ill.—Editor Motor Age—What is the bore and stroke of the motor used in the Buick, model 17?

2—What is the S. A. E. horsepower of this motor?

3—In filing applications for motor car licenses in Illinois, where a fee is charged according to the horsepower of the car, what method should be used to determine same?—R. H. McAlister.

1—The measurements are $4\frac{1}{2}$ by 5.

2—The S. A. E. rating is 32.4 horsepower.

3—The taxable horsepower is that which is obtained by the use of the S. A. E. formula which is expressed

D^2N

Horsepower =

2.5

Where D^2 is the square of the bore in inches

and N the number of cylinders.

Replacing Ignition Coils

Apalachin, N. Y.—Editor Motor Age—I have a Heinze magneto and coil equipment on a two-cylinder tractor. The coil has gone bad. I also have a Splitdorf coil. Does Motor Age think it advisable to use the Splitdorf coil with the Heinze magneto without injury to the coil?—B. L. Hughes.

Yes, if they are both vibrating coils or neither is a vibrating coil. You cannot replace a vibrating coil with a non-vibrating coil or vice versa.

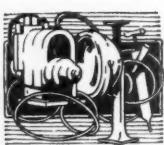
Average Life of a Car

Gooding, Ida.—Editor Motor Age—Is it a good thing to put hot water in a storage battery?

2—What is the average life of the following cars: Ford, Buick, Maxwell, Oldsmobile, Hupmobile, and National?—P. S. Lewis.

1—No, use only cold, distilled water.

2—The average life of a car depends more upon the care it receives than upon the initial price, size, etc. A Ford car may outlive one costing five times as much because of greater care taken during its life.



The Accessory Corner

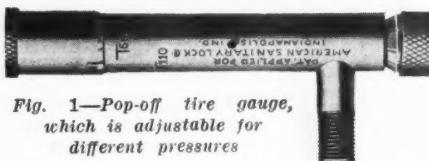


Fig. 1—Pop-off tire gauge, which is adjustable for different pressures

Ever-Tight Piston Rings

A THREE-PART piston ring which is designed to prevent the leakage of mixture and oil past the piston, is being manufactured by the Ever Tight Piston Ring Co., 1424 Chestnut street, St. Louis, Mo. The Ever Tight is a concentric ring with no opening when entirely assembled and hence no chance for allowing leakage of oil. Each part has diagonally split ends, as shown in Fig. 7, the main ring being slotted to receive the two smaller portions. The Ever Tight is said to be as elastic as the regular type. It is made in all sizes from the $2\frac{3}{4}$ -inch, selling at \$1.40, to the 6-inch, selling at \$2.40.

Inland Piston Ring

A novel type of concentric piston ring which is claimed to prevent oil and mixture leakage, has just been announced by the Inland Machine Works, Mound street, St. Louis, Mo. The ring is called the Inland and instead of being made up of a number of parts, is of one-piece which is cut spirally as shown in Fig. 5. This method of cutting gives two tapered ends, which are so supported that they give a uniform thickness to the entire ring. The slots at the ends are less than $\frac{1}{3}$ the width and are placed opposite one another. The rings are said to be heat-treated before grinding so as to prevent distortion of the metal later. The $2\frac{1}{2}$ to $3\frac{1}{8}$ -inch sizes sell for \$1, the 4 to $4\frac{1}{8}$ -inch for \$1.20 and the 5 to $7\frac{1}{2}$ -inch sizes for \$1.50.

Peerless Portable Power Plant

A portable drill and grinder for garages and machine shops where heavy work is required, is being marketed by the United Mfg. Co., Kansas City, Mo., under the name of the Peerless Portable Power Plant. The complete power plant consists of a revolving tool bit socket mounted on the end of a flexible shaft which is driven by a Westinghouse electric motor through a variable-speed friction disk. The motor and friction drive are mounted on an iron base to which swivel casters are fitted, and the unit is inclosed in a metal case fitted with handles to facilitate carrying. Adjustment is provided to take up wear on the driving disk and to vary the contact between the disks for various classes of service.

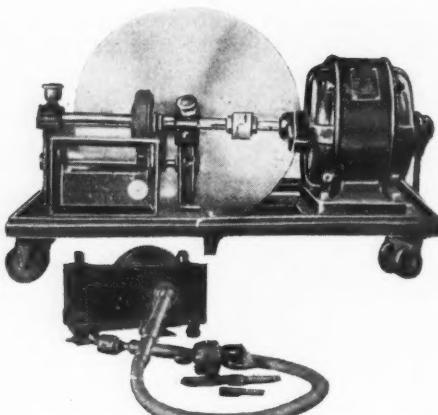


Fig. 2—Peerless portable power plant designed for garages where a portable drill and grinder is needed for heavy work

By means of a lever, six speeds can be obtained at the tool and the latter can be stopped without shutting off the current from the motor. By the use of attachments, eighteen speeds ranging from 165 to 3,200 r. p. m. can be secured for grinding, drilling and polishing. The power plant is built in sizes from $\frac{1}{4}$ to 1 horsepower, the

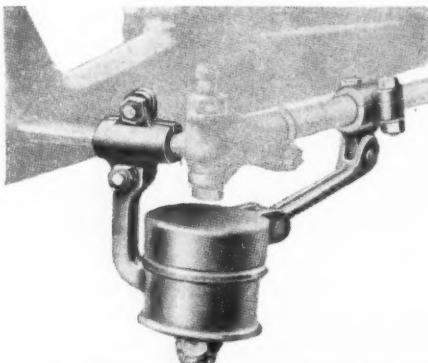


Fig. 3—Safety Steersman, a device for Ford cars, which is said to be making steering easier and prevent front wheel wobbling

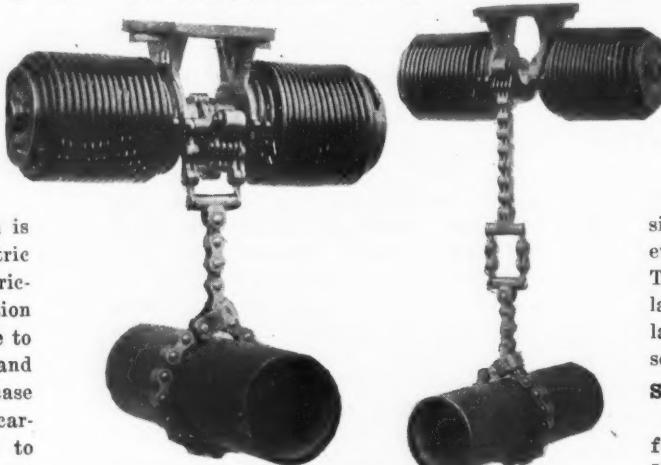


Fig. 4—Parker rebound check, a new accessory on the market and one of unusual construction, using two torsion springs which wind a chain around a cam fastened to a horizontal shaft



Fig. 5—Inland piston ring, which is of one piece, cut spirally and has the same thickness all around.

largest accommodating drills up to $1\frac{1}{2}$ -inch diameter.

Federal Safety-First Lamp

An odd type of trouble lamp has been announced by the Federal Sign Co., Lake and Desplaines streets, Chicago, this being of the type which uses a dry cell mounted in a steel casing and using a tungsten bulb in a small reflector for giving the light. There are two main parts to the Federal lamp—the casing which is 10 inches high and 3 in diameter and in which the dry cell is mounted, and the hood which contains the reflector, bulb and switch. Two handles are provided, one for carrying the lamp as one would an oil lantern and the other for gripping it with the hand. The illustration in Fig 10 shows both handles. The bail grip may be removed if not needed. The switch is readily accessible and may be used for controlling the light intermittently or it may be set so as to keep the lamp in the circuit continuously. The casing is finished in dark blue enamel and contains an ordinary No. 6 dry cell. Price is \$2 complete with dry cell.

Wagner Lighting System for Fords

The Wagner Specialty Co., 1902 Broadway, New York, is featuring a generator lighting system for Ford cars, using the Ward Leonard system of current control, Edmund & Jones lamps, Willard battery and Connecticut switch. The generator is belt-driven from the front end of the motor and is capable of delivering 8 amperes at 6 volts, thus feeding to lamps sufficient to give 50 candlepower. The generator, shown in Fig. 6, has its armature mounted on ball bearings and the control unit on top of the casing. Generator dimensions are: length 6 inches and diameter 4 inches. It weighs 10 pounds. The complete outfit, including new lamps, lists at \$56, and without new lamps, at \$50. The generator alone sells for \$25.

Sunbeam Lighting System

A simple generator lighting outfit for Ford cars is that made by the Milwaukee Specialty Mfg. Co., Milwaukee, Wis., the outfit including a 7-volt permanent-magnet generator

with cutout and governor, battery lamps, wiring, etc. The system is called the Sunbeam and the generator uses a special supporting bracket attached to the motor by three bolts. The drive is by means of a pulley and belt, the driving member being the fan shaft. Armature shaft speed is kept constant by means of a fly-ball governor mounted, as shown in Fig. 8. A suitable cutout is used to prevent the battery from discharging back into the generator when the motor is not running. The generator weighs 14 pounds and is $8\frac{1}{2}$ by 4 by $6\frac{1}{4}$ inches. The necessary

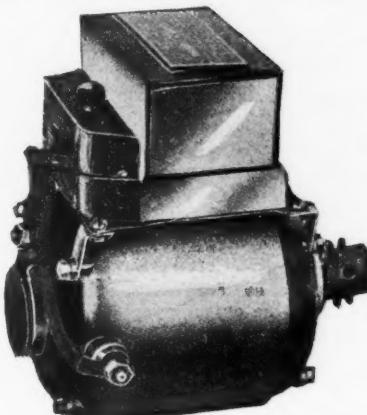


Fig. 6—Wagner lighting system for Ford cars uses the generator shown above, which has a Ward Leonard current controller. The capacity is 8 amperes at 6 volts.

switches, meter, wires, terminals, etc., are supplied with the system, which sells for \$47.50.

Pop Off Tire Gauge

An adjustable tire gauge which allows the tire to be pumped only to the indicated amount, is the latest motor car accessory from the American Sanitary Lock Co., Indianapolis, Ind. The air line is attached to the gauge and a portion of the latter to the tire valve and after the pressure has reached that set by the operator, the excess is relieved by a valve thus insuring that the casing is pumped to the correct pressure. The scale is graduated from 60 to 110 pounds and the adjustments are made by turning a knurled cap shown in Fig. 1 at the end of the gauge. Price is \$1.

Parker Rebound Check

A rebound check of uncommon construction is the Parker, made by Rupe & Kemp, Muncie, Ind. The Parker, shown in Fig. 4, consists of two torsion springs mounted on a bracket and to which each spring is attached at one end only. The other ends of the springs are fastened to a longitudinal shaft fitted with a cam over which a chain passes. The latter is looped around the axle of the

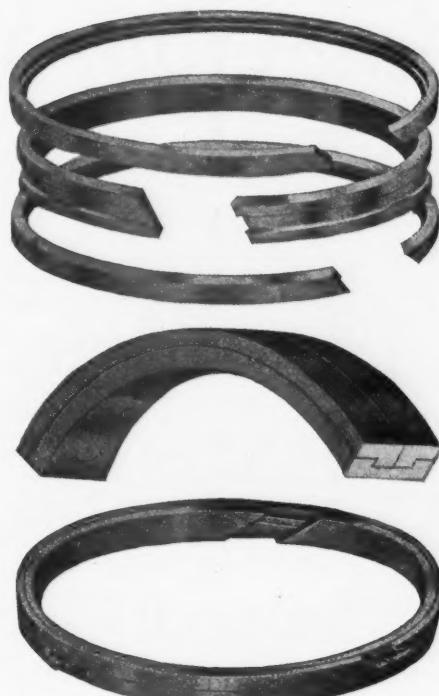


Fig. 7—Ever-Tight piston rings, which is made up of three parts which interlock as shown in the center illustration.

car, as shown herewith. When the car strikes a bump or depression in the road and the axle rises, the torsion springs of the device wind the chain around the cam which holds the chain after the axle has reached its highest point, thus resisting rebound of the car spring. Prices range from \$12.50 to \$25.

Price of Clero Horn Reduced

The Fitzgerald Mfg. Co., New Haven, Conn., has reduced the price of its Clero hand-operated warning signal from \$4.50 to \$3.50. At the same time the price of the extra long projector has been reduced from \$5 to \$4. The regular model is finished in black with nickel bell and the extra long projector has black finish with the rim of the bell nickelized.

Both signals are of the type in which the operating lever is vertical, the signal being operated by depressing the lever straight down. The supporting bracket is substantial and is so arranged that the

attachment of the horn required but three screws and is easily done.

Ford Safety Steersman

To make the steering of a Ford car safer and easier, the Racine Auto Specialty Sales Co., 826 Consumers Bldg., Chicago, has brought out the Safety Steersman, which consists of a self-centering spring mounted in a malleable-iron housing and attached by two arms to the steering spindle arm and tie rod. Fig. 3 shows the device installed. In operation the front wheels are prevented from leaving a course set by the



Fig. 9—Federal Safety-First trouble lamp, a new type using a dry cell for current. The light may be used intermittently or continuously.

driver by the resistance offered by the spring in the housing. Steering is said to be made easier and front wheel wobbling eliminated. Price is \$8 per pair.

Midget Private Garage Pump

The Gardner Governor Co., Quincy, Ill., offers the Midget private garage air compressor which is a single-cylinder machine with a capacity of 1.25 cubic feet of air per minute at 66 r. p. m. and capable of pumping to 125 pounds continuous working pressure. It is an all-metal design using splash oiling and weighing 30 pounds complete. It is made in two types with tight pulley and loose pulley, the former listing at \$16.50, and the other at \$18. The Midget is shown in Fig. 10.

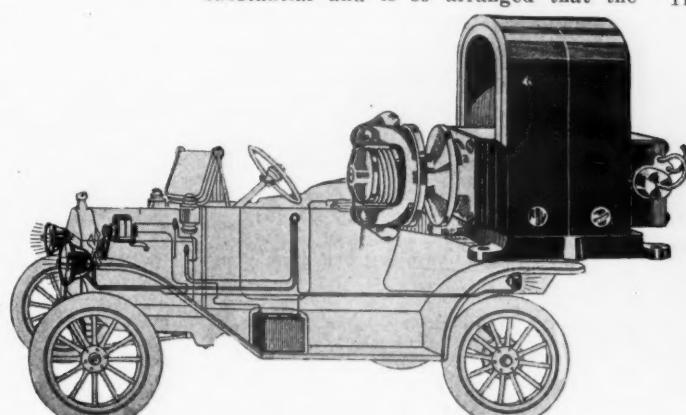


Fig. 8—Sunbeam lighting generator for Ford cars and method of installation. It is driven by belt from the fan shaft and is capable of generating 7 volts and supplying 5 lamps.

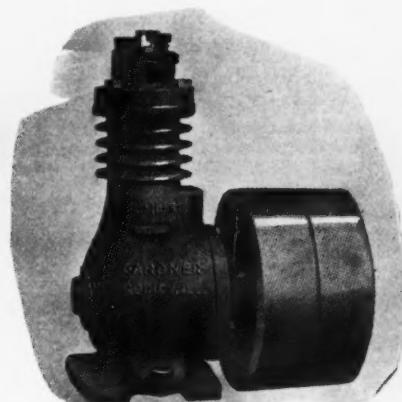


Fig. 10—Midget private garage pump with loose pulley.



From the Four Winds



GRAND RAPIDS Jitney Mad—Up to April 1, 1913 licenses to drivers of jitney cars had been issued by the city clerk of Grand Rapids, Mich. It is stated that 178 licenses were for buses in daily operation and fifteen were for taxis and hacks.

Motor Races at State Fair—An effort on the part of the Dallas Automobile Association is on foot to have motor car racing at the Texas state fair. The horse races at the fair have been abandoned and instead motor car racing may be established.

Issues Map of Gettysburg—The Gettysburg National Park commission, an adjunct of the war department at Washington, has issued for the convenience of summer tourists a map showing the various roads and avenues on the battlefield with suggestions of routes to be taken in seeing the various points of interest.

Appropriate Money for Roads—A bill has been passed appropriating \$187,772 for highway purposes in Pennsylvania. This is money collected from the sale of motor car licenses prior to December 13, 1913. While it is not a large amount, it will enable the highway department to take care of some much-needed improvements. The money was held up owing to controversies among department heads.

Worcester Dealers Protest—A body of Worcester, Mass., motor car dealers, backed by members of the motor club and the chamber of commerce, had a conference with the board of aldermen a few days ago and lodged a protest against the proposed new city ordinance that would limit to 15 minutes in any 1 hour the time a vehicle may stand on Main street in that city. It is felt the ordinance will not be passed now.

Oil for Milwaukee's Streets—Approximately 500,000 gallons of crude oil will be spread over the macadam streets of Milwaukee, Wis., during the season of 1915. Contracts for furnishing the city with 300,000 gallons have just been let and this amount, with the entire reserve supply of 200,000 gallons, will be used up this year. The county board of supervisors is planning to use oil on its macadam roads beginning this season. No more macadam roads are being constructed, all money being devoted to 18-foot concrete road work.

New Traffic Signs in Tacoma—The Tacoma Automobile Club has recently erected new traffic signs, which fill a long-felt want in that city. The signs are diamond shaped with a small black border and lettered in black. The hospital sign bears a red cross at the top and the words, "Hospital—Quiet," while the school sign reads, "Four Miles—School—Careful," with the club's name at the bottom. The club will also post danger signs on the roads of Pierce county, so that all dangerous curves and crossings will be noted and accidents avoided.

Premier to Hold Coast Tour—A Premier owners' tour to the San Francisco and San Diego expositions will leave Chicago August 7 in charge of Sales Manager Walter M. Bellings of the Premier Motor Mfg. Co. and Harry Newman, vice-president and general manager of the Western States Automobile Co., Chicago, distributor for Premier and Scripps-Booth cars. The party will proceed west via the Lincoln highway to San Francisco, the Pacific highway to San Diego and return east via the National Old Trails route. This will give them a wonderful opportunity of seeing a large portion of the United

States. While Premier owners from all over the United States are being invited to take part in the trip, any motorist is welcome to become a member of the party. Arrangements are being made whereby expert mechanics will be sent along in a specially equipped machine.

New Haven Club Thriving—The New Haven Automobile Club is now thriving and the campaign to run the membership up to 1,000 is progressing rapidly. At the last weekly meeting thirteen new members were put on the rolls and the total is now close to 900. That makes the club one of the largest in the east, and for the size of the city it is believed that the club outranks any other in the country.

Ambulances for Tommy Atkins—The appeal of the Canadian Red Cross Society for motor ambulances has been answered by the Canadian people generally in a splendid manner. Already eleven ambulances have been delivered to the British Red Cross Society to be used at the front as that society may see fit. Ten others have been ordered and eight ambulances are in sight, though they have not yet been definitely promised.

Will Teach Women to Drive—To meet the demand of the growing class of women motorists in Milwaukee for a course of instruction in the construction, care, operation and maintenance of the modern motor car, Professor E. M. Barrows, Milwaukee district representative of the university extension division of the University of Wisconsin, who is in charge of the course established last fall, has arranged for a new course of ten lectures exclusively for women. The men's

course is now in its second series because of the demand that it be repeated. The woman's course will be given each Friday afternoon at 4 o'clock for 10 consecutive weeks. The work laid out for the women students does not include actual operations that might soil hands or clothes.

Use Motor Cars in Maneuvers—Motor cars were extensively used by the 28th battalion Canadian light infantry during its recent maneuvers northwest of Winnipeg. The entire equipment for 1,000 men, including camp outfits, cooking ovens, etc., were transported by means of motor trucks. The officers of the staff travelled in cars from point to point during the training operations. This battalion will leave for eastern Canada at an early date, preparatory to sailing for England.

To Raise Funds for Memorial Miles—Women motorists of Atlantic City, N. J., have organized the Women Memorial Miles Association, the object of which is the raising of part of a fund of \$10,000 to pay off two units of the Lincoln highway in memorial miles to the women drivers of the country. Shields will be sold at \$1 each and teas, card parties, etc., will be held to raise proceeds. Mrs. Mary Walter Harper is president of the organization, Mrs. E. W. Clark, of Camden and Atlantic City, treasurer; and Mrs. H. C. Edwards of Atlantic City, chairman of the finance committee.

Los Angeles May Run Bus Line—A motor bus line into Griffith park has been projected by the city council of Los Angeles. Owing to a freak charter provision, no electric railway may run its line into the park, and the motor bus is the next best thing until the time comes when a railway line may legally be constructed to accommodate the visitors to the park. The city attorney and the park commission as well as the council favor the establishment of a line under municipal supervision to insure service for those who wish to visit the municipal golf links and other attractions of the city park.

Start Work on Concrete Roads—Construction on the first link of the new county highway system on which \$1,750,000 will be expended in the next year in California was begun last week when a crew of forty men started improving the road between San Bernardino and Redlands, known as Colton avenue, and a part of the Ocean-to-Ocean highway. The road will be graded, rolled and topped with a concrete base. During the summer the road commission expects to complete a mile of road a month on each division of the county work. About 450 miles of road is included in the plans under the bond issue.

Hybrid Car of Many Parts—One of the strangest cars ever built and which is as yet unnamed is owned by C. H. Williams of the Portland branch of the Goodyear Tire and Rubber Co. In order not to offend any of the motor car dealers, Mr. Williams used parts from numerous makes of machines. When the car was ready for the road, it was found to consist of a part of every known make of car selling under \$3,000. For instance, the frame and part of the motor are from the Ford factory. The pistons are from a Mercer racer, as is also the crank shaft. The camshaft is a special design with tungsten steel valves. The rare construction is composed of parts of several cars in such manner that the welded parts are in perfect working order.

Coming Motor Events

CONTESTS

- * April 20-22—Road races, Oklahoma City, Okla.
- April 30-May 1-2—Track meet, Portland, Ore.
- May 8—Track meet, Salem, Ore.
- May 15-16—Track meet, Vancouver, Wash.
- May 15-16—Track meet, Centralia-Chehalis, Wash.
- May 29-30—Track meet, Seattle, Wash.
- * May 29—500-mile speedway race, Indianapolis, Ind.
- June 9—200-mile dirt track race, Galesburg, Ill.
- * June 19—500-mile speedway race, Chicago.
- * July 3—300-mile race, Sioux City, Ia.
- July 4—Track meet, Oshkosh, Wis.
- * July 4-5—Speedway races, Tacoma, Wash.
- July 4—Road race, Visalia, Cal.
- * July 5—Speedway races, Omaha, Neb.
- July 9—100-mile dirt track race, Burlington, Ia.
- July 31—Road race, Denver, Colo.
- August 14—Dirt track races, Janesville, Wis.
- August 20-21—Elgin road races, Elgin, Ill.
- August 28—100-mile dirt track race, Kalamazoo, Wis.
- September 6—Speedway races, Detroit, Mich.
- September 6—Speedway races, Providence, R. I.
- October 1-2—Track meet, Trenton, N. J.

Sanctioned by A.A.A.

SHOWS AND CONVENTIONS

- May 17-18—Annual meeting of American Automobile Association, Boston, Mass.
- June 14-17—Summer meeting of Society of Automobile Engineers, Detroit and Great Lakes cruise.



Among the Makers and Dealers

MORE Than Doubles Capital Stock—The capital stock of the Michigan Steel Casting Co., Detroit, Mich., has been increased from \$90,000 to \$210,000.

Brooks Leaves Herff-Brooks Corp.—H. H. Brooks has severed his connection with the Herff-Brooks Corp., Indianapolis, Ind., and joined the Pontiac Chassis Co., Pontiac, Mich., manufacturer of chassis for the trade.

Rapid Gain in Oldsmobile Sales—According to J. V. Hall, sales manager of the Olds Motor Works, the company outsold its record for March, 1914, by 128 per cent, this increase being figured on a basis of gross business done. During January there was an increase of 74 per cent, and during February a gain of 93 per cent over the same months of last year.

Buys Detroit Foundry Plant—The Peninsular Smelting Co., Detroit, has purchased the plant of the old Detroit Foundry and Mfg. Co., 1218 Hastings street, and will soon move there from its present location at 52 Baltimore avenue. The new plant consists of a one-story brick building 90 by 165 feet and provides 11,000 square feet of floor space.

New Factory for Wheel Company—Construction work will be started shortly on a new one-story brick and steel building, 90 by 313 feet, for the Kelsey Wheel Co., Detroit, Mich. When completed, the total floor space of the company, including its plant in Memphis, Tenn., will aggregate more than 205,000 square feet. The new structure, which will cost \$50,000, will be used for stamping.

Windshield Maker Must Enlarge Plant—The Superior Mfg. Co., Ann Arbor, Mich., which originally manufactured only gasoline lighting systems but which for some time has been making windshields, is rapidly developing this part of its business to such an extent that it may be necessary to enlarge the plant. President H. H. Seeley reports having orders for 50,000 windshields for the Buick Motor Co., Flint, Mich., and 50,000 for Dodge Bros., Detroit, besides receiving the orders for the entire output of the Reo Motor Car Co., Lansing, Mich., and the Chalmers Motor Co., Detroit.

Protest on Freight Rate Futile—The interstate commerce commission has decided that railroad companies have not been unreasonable in charging \$2.15 per 100 pounds on shipments of motor truck axles from Detroit to Los Angeles, Cal. The decision was made in connection with the plea of the Moreland Motor Car Co., Los Angeles, Cal. This concern, which makes motor trucks, had been buying its axles in Detroit and received some shipments which were billed at the rate of \$1.15 per 100 pounds. Later the railroads raised the rate to \$2.15 per 100 pounds, which the car manufacturers declared was exorbitant. Since the opening of the Panama canal, the Moreland company has been receiving its shipments of axles over that route.

New Factory for Valve Maker—A new plant will be erected at East Grand boulevard and Oakland avenue, Detroit, for the Schlieder Mfg. Co., which makes motor car valves. The structure will be partly one story and partly two-stories high and will cover a piece of ground 80 by 135 feet, which was purchased for \$10,000. The new plant will provide 14,800 square feet of floor space or over 50 percent more than now available. The concern was organized in 1909 in Buffalo, N. Y., and moved to Detroit in 1911, when the original capital stock was increased from \$10,000 to \$20,000. Recently a

400 percent stock dividend was declared to provide for the increase of the capital stock to \$100,000. The annual output has increased from 12,000 valves to over 100,000.

McGraw Tire Dividend Declared—The McGraw Tire and Rubber Co., East Palestine, O., has declared the regular quarterly dividend of 1½ per cent on its preferred stock. It is payable April 1 to stockholders of record March 20.

Dawe Heads Research Club—C. N. Dawe, metallurgist of the Studebaker Corp., was elected president of the Steel Treating Research Club, at the annual meeting. C. R. Poole, chemist and metallurgist of the Frost Gear and Forge Co., Jackson, Mich., was elected secretary. The club's members are chemists, metallurgists and hardening room foremen of the plants in Michigan. Asso-

ciate membership is open to representatives of manufacturing concerns whose products are connected with heat treating departments.

Plan Addition to Canadian Plant—The Regal Automobile Co. of Detroit is planning to enlarge its Canadian plant, which is located at Berlin, Ont.

Pays Dividend April 1—Preferred stock holders of the Continental Motor Mfg. Co., Detroit, Mich., received the semi-annual dividend of 3 per cent April 1.

Body Maker Enlarging Plant—A permit for a three-story addition, 55 by 110 feet, has been obtained by the Griswold Motor Body Co., Detroit, Mich. When completed it will mean 55,000 square feet of additional floor space or an increase of 60 percent over what the concern now has.

New York, N. Y.—Ross Garage and Taxi Co., garage and motor livery business; capital stock, \$1,000; incorporators, Ben Ross, Geo. Kearney and Rudolph Loewenthal.

New York, N. Y.—Safety Auto Equipment Corp., capital stock, \$10,000; incorporators, Samuel M. Richardson, Harold A. Vincent and Moses Ely.

New York, N. Y.—Simpson Motor Corp., automobile business; capital stock, \$3,000; incorporators, Edward Cynamon, Geo. Levine and Abr. Levine.

New York, N. Y.—Thomas Garage, to manufacture motor cars, garage business, etc.; capital stock, \$5,000; incorporators, Julius E. Siegel, Thomas Ingram and Charles Bell.

Norfolk, Va.—Motor Sales and Service Co., capital stock, \$4,000 to \$25,000; incorporators, R. C. Taylor, E. M. Springer.

New York, N. Y.—Cornfield Resilient Wheel Co., to manufacture spring wheels for trucks, motor cars and other vehicles; capital stock \$400,000. Incorporators Stanislaus Verusio, William H. Byrne and Noah Cornfield.

New York, N. Y.—Lee Garage, garage business, capital stock \$5,000; incorporators Ether P. Roome, William H. Roome and John C. Rogers.

New York, N. Y.—Multiple Worm Axle Corp., to manufacture driving gear for motor cars, etc.; capital stock \$100,000; incorporators, Albert W. Chase, John R. Rowland and Albert L. Kull.

New York, N. Y.—Yours Truly Garage, garage business, capital stock \$3,000, incorporators Arnold H. Tramer, Israel Rufus and Jacob Efrus.

Norfolk, Va.—Norfolk Jitney Bus Co., to operate motor cars for hire; capital stock \$1,000 to \$50,000. Incorporators T. Gray Coburn, Joseph T. Darden.

Norfolk, Va.—Waterman Truck and Automobile Co., motor car business; capital stock \$5,000 to \$15,000, incorporators, J. E. Waterman and J. K. Wells.

Pelham Manor, N. Y.—K. Auto Service, garage and motor car business; capital stock, \$500.00; incorporators, Dora A. Dusenberry, Edith A. Kaye and Roye C. Kaye.

Portsmouth, Va.—Portsmouth Automobile and Supply Co., capital stock, \$3,000 to \$10,000; incorporators, J. E. Norman, Joseph L. Owens, H. L. Privett.

Portsmouth, Va.—Waterman Automobile Co., capital stock, \$1,500 to \$10,000, incorporators, J. K. Wells, J. E. Waterman.

Rochester, N. Y.—Heardsley-Gorsline Co., motors, supplies, etc.; capital stock \$10,000, incorporators, T. Carl Nixon, D. E. Gorsline and N. A. Beardsley.

Richmond, Va.—Farmack Motor Car Corp., capital stock, \$8,000 to \$1,000,000; incorporators, Albert J. Farmer, J. L. Grossman and M. Monroe McIntyre.

Richmond, Va.—Virginia Automobile Club, capital stock from \$1,000 to \$20,000; incorporators, C. E. Van Ness, Byron McCallum.

Rosslyn, Va.—Virginia Automobile Service Co., capital stock, \$1,000 to \$25,000; incorporators, Harry H. Fones, James H. Knott.

Spring Valley, Wis.—Kriesel Motor Co., to manufacture gasoline engines and conduct a general machinery manufacturing and repair shop; capital stock, \$25,000; incorporators, Rudy Kriesel, Phoebe Kriesel and John E. Graile.

Syracuse, N. Y.—Central City Taxi & Trucking Co., capital stock \$3,200, incorporators, William H. Draper, Frederick Martz.

Toronto, Ont.—Motordome Ltd., capital stock, \$40,000.

Troy, N. Y.—Empire Motor Truck Corp., motor car business, capital stock \$10,000; incorporators, L. A. Robinson, Albert II Johnson and Walter Dix.

Warren, O.—Park Garage Co., Warren, Ohio, to operate and garage and livery, capital stock to \$5,000, incorporators, Isaac H. Price, John A. Hitchcock, E. Culver, P. W. Boyle and William J. Hyde.

Wheeling, W. Va.—Jitney Transportation Co., capital stock \$5,000, incorporators, Joseph Weiskircher, M. A. Weiskircher, John Weiskircher, Charles and E. Weiskircher.

Recent Incorporations



Brief Business Announcements



FENTON, Mich.—William Stoddard and his son, John, have sold their garage business to E. S. Jennings.

Beloit, Wis.—Louis Humphrey has sold his interest in the Beloit Garage to his partner, Jesse Brabazon, and will engage in a similar business at Savanna, Ill.

Columbus, O.—The Weatherwax and Kraemer Co., is the name of a new concern organized at 67 East Spring street to do special motor car repairing.

Detroit, Mich.—H. P. McQuistion has been appointed manager of the used car department of the Bemb-Robinson Co., distributor of Hudson cars.

Winnipeg, Can.—The Willard Storage Battery Co. has arranged a service station in Winnipeg with the Michael Ert Importing Co., which will open special quarters in the Travellers building to take care of the business.

Washburn, Wis.—Leo and Harvey DeMars have leased the former Willey livery building and are remodeling it into an up-to-date garage to be ready by May 15. The concern intends to engage in the livery business, besides selling and repairing cars. Agency lines have not been selected.

Seattle, Wash.—James P. Corey and S. F. Donnell of the force of Rothweiler & Co., subdealers for the Ford in Seattle, during the month of January sold more Ford cars than any other salesman in the entire Ford organization in the United States. This firm sold 157 Ford cars in January and of

this total Mr. Corey was credited with sixty-six, while Mr. Donnell registered fifty orders.

St. Louis, Mo.—George W. Snarr, of the Wesco Supply Co., has been advanced to the position of manager of motor car accessory sales.

Gaylord, Mich.—The Lewis Garage, a new local concern, has purchased the stock and materials of the Gaylord Motor Car Co., which went out of business recently.

Wild Rose, Wis.—Stone & Johnson, White-water, Wis., has opened a garage and repair shop in the Moldenhauer building at Wild Rose. Agency lines will be selected later.

Wausau, Wis.—L. H. Hall, owner of Hall's Garage, who recently made plans to engage in the wholesale business in central Wisconsin, has established his first branch garage and supply store at Grand Rapids, Wis.

Reeseville, Wis.—W. F. Etscheid, who recently purchased the Reeseville Garage, has leased the building and equipment to Gustav Kletzein. Mr. Etscheid is disposing of his stock of tires and supplies.

Seattle, Wash.—J. H. Irwin has resigned as manager of the Seattle branch of the Goodyear Tire and Rubber Co., after having served in that capacity for many years. He is succeeded by C. C. Miller.

Sheboygan, Wis.—In a recent issue of Motor Age, it was stated that the name of the Rummel Auto Co. had been changed to the Rummel-Kriel Co. This was a mistake. The latter concern was formed by E. H.

Rummel, head of the former company, to engage in the jewelry business and the two concerns are individual companies.

East Orange, N. J.—John L. Prewitt for several years connected with the Chalmers and Palmer-Singer factories and for the past 2 years sales manager for J. W. Mason, of Newark, N. J., has resigned to open a wholesale and retail supply store to be known as The Essex Auto Supply Co., at 453 Main street.

Racine, Wis.—M. Wayne Everett, for the past 9 years in charge of the repair department of the Mitchell-Lewis Motor Co., has resigned to assume the office of sales manager of the local branch of the Wisconsin Gas and Electric Co.

Philadelphia, Pa.—The entire business of the S. R. Blocksom Motor Co., local Stutz agency, has been taken over by S. R. Blocksom. No changes in personnel of the company will be made and the Stutz headquarters will continue to be at 661-663 North Broad street.

Lake Geneva, Wis.—Matt and Dewey Lowry have formed a partnership under the style of Lowry Bros. and will establish a garage in the Hoeg building, to be named the Ford Garage. A specialty will be made of Ford service and a Ford taxicab service will be operated.

Grand Rapids, Mich.—The motor car dealers of this city have organized the Auto Business Association, the object of which is to bring about closer relationship between the dealers with a view of obtaining more

Recent Agencies Appointed by Motor Car Manufacturers

PASSENGER CARS

Town	Agent	Make	Town	Agent	Make
Atchison, Kan.	Dominion Distributing Co.	King	El Monte, Cal.	H. A. Hall	Herff-Brooks
Alto, Mich.	Heskett & Myers	Herff-Brooks	Fullerton, Cal.	Stuart & Smith	Maxwell
Avon, N. Y.	Hugh Wilcox	Buick	Fall River, Wis.	Rigby Garage	Oldsmobile
Boston, Mass.	J. E. Dunton	Herff-Brooks	Fall River, Mass.	W. L. Ross	King
Boston, Mass.	F. R. Beck	Herff-Brooks	Gull Lake, Sask.	T. A. Gossling	Detroiter
Boston, Mass.	E. W. Shearburn	Herff-Brooks	Gallion, O.	Mansfield & Dick	Metz
Boston, Mass.	W. B. McCall	Herff-Brooks	Grand Rapids, Mich.	Mathew Barber	Oldsmobile
Burrton, Kan.	John W. Elliott	Koehler	Greenfield, Mass.	Hickey & Callardt	Herff-Brooks
Butte, Mont.	Elmer E. Williams	King	Greenfield, Mass.	J. H. Cavanaugh	King
Bridgeton, N. J.	J. C. Judd	Lexington	Grand Rapids, Wis.	H. E. Longfellow	Kisselkar
Burlington, Wis.	Owen Kelly	Case	Gooding, Idaho	Howard A. Wood	Dodge
Baltimore, Md.	Herold Auto Co.	Kisselkar	Grand Rapids, Wis.	West Side Motor Co.	Kisselkar
Baltimore, Md.	Smith & Neville	Kisselkar	Hull, Ia.	The Champion Garage	Buick
Baltimore, Md.	C. E. Johnston	Kisselkar	Hays, Kan.	The Mound City Auto Co.	Chevrolet
Beverly, Mass.	Upton & Holt Garage	Dodge	Haddam, Kan.	International Garage	Oldsmobile
Battle Creek, Mich.	Strube Motor Co.	Herff-Brooks	Hopkinsville, Ky.	John A. Steele	Ford
Bessemer, Mich.	Jos. Krautkramer	Maxwell	Hardin, Ill.	Motor Sales, Inc.	Lexington
Belvidere, Ill.	R. A. Loehr	Buick	Hollywood, Cal.	J. W. Qualls	Herff-Brooks
Basin, Wyo.	Holm & Craven	Oldsmobile	Hamilton, O.	O. G. Beach	Buick
Blanchardville, Wis.	Buckmaster Bros.	Oldsmobile	Hannibal, Mo.	Kelly-Case Co.	Maxwell
Carrier Mills, Ill.	A. L. Davis	Studebaker	Hollywood, Cal.	A. L. Luce	Maxwell
Chicago	Thatcher Imp. & Merc. Co.	Maxwell	Jacksonville, Fla.	Bennett Motor Car Co.	King
Cazenovia, Wis.	E. P. Greenlee	Kisselkar	Janesville, Minn.	Pocasset Garage & Mach. Co.	Oldsmobile
Columbus, O.	Jno. J. Metcalf Mill Sup. Co.	Case	Jefferson City, Mo.	Burnham-Robinson Co.	Maxwell
Columbus, Ind.	Waterford Auto & Impl. Co.	Dodge	Kenosha, Wis.	Pacific Garage	Lexington
Chippewa Falls, Wis.	Newton H. Davis	Ford	Kingman, Ariz.	C. W. Smith	Herff-Brooks
Chetek, Wis.	A. E. Knaak	Case	Lordsburg, Cal.	Boston Motor Sales	Auburn
Cincinnati, O.	The Auto & Accessory Co.	McIntyre	Lake Geneva, Wis.	Louck's Motor Co.	Oldsmobile
Dixon, Ill.	The Galion Motor Car Co.	Buick	LaGrange, O.	F. H. Hembrock	Metz
Dixon, Ill.	R. L. Green	Oakland	Lawrence, Kan.	P. E. Graham	Oldsmobile
Dexter, Me.	H. H. Kelly	King	Lehigh, Kan.	N. W. Fox	Koehler
Davison, Mich.	Lehigh Land Co.	Herff-Brooks	Lorain, O.	Dale C. Kelley	Case
Deerfield, Wis.	Karl E. Koester	Case	Leopolis, Wis.	Spencer Investment Co.	Kisselkar
Dayton, O.	The Lorain Garage	Buick	LaBelle Mo.	Foll & Quammen	Dodge
El Centro, Cal.	W. G. Wagner	Maxwell	Matawan, N. J.	J. R. Elwell	Oldsmobile
El Centro, Cal.	Hampden Auto Sales Co.	Lexington	Montfort, Wis.	W. B. Nye	Kisselkar
Elyria, O.	J. F. Royer	Case	Modesto, Cal.	Harris Auto Co.	Buick
Emporia, Kan.	The Williams Garage	Koehler	Montfort, Wis.	Miami Motor Co.	Kisselkar

co-operation between dealers and owners for the development of the roads in western Michigan and securing more equitable legislation. R. E. Becker was elected president of the association; J. T. Bruce, vice-president; E. T. Coulon, secretary; C. P. Palmer, treasurer.

Trenton, N. J.—The Midler Auto Supply Co., 7 North Montgomery street, has been made local agent for Braender tires.

Cincinnati, O.—The Guarantee Tire and Supply Co. has just organized and will open an accessory establishment at 714 Race street.

Orfordville, Wis.—H. N. Wagley, implement and farm machinery dealer at Orfordville, Wis., is rebuilding his warehouse to gain garage and repair shop space.

Hartford, Conn.—James H. Whaley, head salesman of the Hartford Buick company, has severed his connection with that concern and has been appointed manager of the New Haven Chevrolet branch.

Detroit, Mich.—George M. Graham, designing engineer of the Massnick-Phipps Mfg. Co., which makes the Perkins four and eight-cylinder motors, has been made purchasing agent.

Seattle, Wash.—Owen McCusker, Jr., for the last 3 years located in Seattle as manager of the factory branch of the Locomobile Co. of America, has resigned. His post will be filled temporarily by R. W. Crosby.

Port Huron, Mich.—Frank Keeler has leased the repair department of the garage business of Frank S. Church. He probably will open a repair shop later in the year in some other section of the city.

Ladysmith, Wis.—The Ladysmith Automobile Co. has sold its business to John Ryall, former owner of the garage, and Thomas Boardman, then associated with Mr. Ryall.

The reorganized business will be known as Ryall's Garage. A repair department has been established. The concern represents the Ford in Rusk and Sawyer counties, Wis.

Dexter, Mich.—The old Bogg planing mill has been remodeled and is now used as garage and salesrooms by Reason Bros., who came here from Stockbridge.

Mendon, Mich.—M. C. Flewellin, who some time ago retired from the garage business, has again opened a garage on Portage street.

Minneapolis, Minn.—The Kleckner Shock Absorber Co., has taken over the distribution of the Right Shock absorber for the states of Minnesota, North and South Dakota. The headquarters are at 1514 Hennepin avenue.

Columbus, O.—F. E. Avery & Son, which has the agency for the Jeffery in central Ohio, has also taken over the retail end of the business in Columbus and Franklin county, formerly held by the Capital Motor Car Co.

Kennan, Wis.—Thomas Olson of Catawba, Wis., has purchased a site at Kennan and will build a large business block, half of which is to be equipped for garage and repair shop purposes. Mr. Olson will also conduct a motor livery.

Hartford, Conn.—George Babcock, driver of one of the English Sunbeams in the Corona races, has returned to Hartford and will represent the Master carburetor in this vicinity. Babcock was with the Electric Vehicle Co. and the Pope Mfg. Co. in the early days of the industry.

Madison, Wis.—Orrin D. Smart and E. H. Phillips of Waukesha, Wis., have taken possession of the University Garage, 617 University avenue, purchased recently from C. I. Danielson. Mr. Smart, a graduate of the state university college of engineering, Mad-

ison, opened the first garage in Waukesha, Wis., in 1907. Mr. Phillips is a well-known engineer, having resigned as foreman of the Waukesha Motor Co. to engage in business. Previously he was associated with the Anger Engineering Co., maker of A. E. C. cars, Milwaukee, as engineer in charge of construction.

Fond du Lac, Wis.—L. W. Romaine has retired from the Service Motor Co., Fond du Lac, Wis., to form a partnership with H. L. Engels of St. Cloud, Wis., in the farm implement and motor car business. The firm name is Engels & Romaine.

Seattle, Wash.—Louis Roesch has just returned to Seattle from Florida where he has been engaged in the motor car business for the last 3 years. He will now be associated with his brother Edward, distributing Velle cars throughout western Washington.

Williams Bay, Wis.—William G. DeGroff and son, L. W. DeGroff, are preparing to build a modern fireproof garage, to be ready for at least partial occupancy on May 1. The firm will be styled the Williams Bay Motor Co. William Vroman has been engaged as mechanical manager.

Forestville, Wis.—August Jennerjohn, recently appointed agent for the Case, is establishing a garage and repair shop in the Schmitz building which he has occupied as a farm implement dealer, and has leased the Jerovitz garage nearby to take care of his requirements.

Chicago—G. E. Brothers, formerly of the Western Tire Co., has been appointed solid tire representative for the Chicago district by the Hood Tire Co., Watertown, Mass. The Hood company only recently entered the solid tire field but is manufacturing them in both the American and European type.

Recent Agencies Appointed by Motor Car Manufacturers—Continued

PASSENGER CARS

Town	Agent	Make	Town	Agent	Make
Medina, O.	Hannibal Wagon Co.	Haynes	Springfield, Mass.	C. F. Little	King
Mt. Vernon, Mo.	E. L. Adams & J. A. Nichols	Oldsmobile	Springfield, Mass.	O. M. Skinner	King
Mantua Station, O.	John H. Williams	Case	St. Joseph, Mo.	Carl C. Smith	Oldsmobile
Sioux Falls, S. D.	Evans Transfer Co.	Dort	St. James, Minn.	Meyer & Uhlihorn	Dort
Marion, O.	Peter Burns	Case	Shadyside, W. Va.	A. R. Manley	Allen
Monticello, Ill.	Metz Motor Car Co.	Metz	Stewartville, Minn.	Miland & Ballard	Dort
Northfield, Minn.	John Munger	Oldsmobile	St. Charles, Minn.	G. L. Wheelock	Dort
Newark, O.	Baumgartner Bros.	Buick	St. Catherines, Ont.	Lewis H. Hall	Saxon
North Adams, Mass.	J. R. Roberts	Detroiter	San Bernardino, Cal.	Hayes-Johnson Co.	Pilot
Norwalk, O.	Baker Tire Co.	Haynes	Springfield, Minn.	Fred Bott	Dort
North Adams, Mass.	Fritzmeier & Hewit	Herff-Brooks	Steubenville, O.	A. A. Scott	Case
Natick Mass.	Anton Herl	Herff-Brooks	San Jacinto, Cal.	Parkway Garage	Auburn
Ontario, Cal.	Downer & Fairchild	Dort	Santa Ana, Cal.	Mills Implement Co.	Herff-Brooks
Olmst, Kan.	E. E. Booth	Maxwell	Sherburn, Minn.	A. D. Packard & Son	Dort
Ottawa, Kans.	Michael J. Knipfing	Koehler	Stillwater, Minn.	F. C. Kern	Dort
Osseo, Minn.	Osseo Hdwe. Co.	Dort	Stafford, Kan.	Conqueror Mfg. Co.	Maxwell
Ontonagon, Mich.	Lathrop Hdw. Co.	Herff-Brooks	St. Croix Falls, Wis.	J. A. Mack	Dort
Oshkosh, Wis.	Hunter & Son	Paige	Somerset, Manitoba	H. C. Kaisler	Ford
Oxnard, Cal.	W. M. Lofland	Buick	Toronto, Can.	Voelz & Boehn	Chevrolet
Prairie du Chien, Wis.	H. E. Crocroft	Case	Topeka, Kan.	W. E. Ross	Oldsmobile
Prairie du Chien, Wis.	Markham & Allen	Case	Tipton, Mo.	H. C. Kaisler	Reo
Peterson, Minn.	Peterson Mch. Co.	Dort	Thatcher, Ariz.	Keller Sales Co.	Paterson
Prairie Farm, Wis.	H. Roemhild	Dort	Uniontown, Pa.	Keystone Automobile Co.	Saxon
Pocatello, Idaho	J. R. Pirtle	King	Ventura, Cal.	Cox-Scott Hdw. Co.	Dodge
Riverside, Cal.	C. F. Little	Maxwell	Waterloo, Iowa	Burd Auto & Supply Co.	Dort
Pomona, Cal.	A. R. Manley	Ford	Washburn, Ill.	C. L. Jury	Kisselkar
Redondo, Cal.	John H. Layer	Case	Walsenburg, Colo.	Unfug & Unfug	Oldsmobile
Ruggles, O.	J. A. Lewis	Case	West Union, W. Va.	Trainer & Troutman	Saxon
Rigby, Idaho	Ben Buxton	Lexington	Wellington, O.	Robbins & Krug	Case
Santa Ana, Cal.	El Monte Garage	Maxwell	West Liberty, Iowa	Waite & Faires	Moon
Santa Barbara, Cal.	Chas. B. Perry	Maxwell	West Creek, N. J.	The Elyria Auto Sales Co.	Buick
San Fernando, Cal.	Heyser-Finley Motor Co.	Chandler	Westbury, N. Y.	Duren Bros.	Jeffery
Statesville, N. C.	Harris Auto Co.	Ford	Worcester, Mass.	California Motor Car Co.	King
Salina, Kan.	The Spot Garage	Hollier	Worcester, Mass.	H. B. Gillespie	King
Redwood Falls, Minn.	W. F. Jackson	Dort	Wooster, O.	Larrives & Co.	Case
Scottdale, Pa.	L. D. Larimer	Lexington	Wichita, Kans.	King Motor Sales Co.	King
San Bernardino, Cal.	Joseph Staub	Paige	Wakefield, Mass.	A. B. Gilbert	King
San Pedro, Cal.	H. Ross Maddocks	Saxon	Wrightstown, Wla.	J. A. Bushnell	Case



The Motor Car Repair Shop



DARK colors are the best to use in the painting of the car. They wear better than the lighter shades which are apt to be affected by the sun and by mud and grease spots. This difference in service with various colors is due primarily to the color varnish which has a gum as its base. The dark gum is most serviceable, and from it come the dark varnishes. The lighter colors require lighter varnishes, and hence the wear is decreased.

The best colors of all from the standpoint of service—and by that is meant the lasting qualities, freedom from peeling and cracking, and the like—are dark blue, dark red and dark green. Strangely enough, these three shades are even more serviceable than the conventional black, on account of the varnish.

Dust is the greatest enemy of good body painting, for the tiny particles settle on the sticky surface in surprising numbers, making a rough surface which gets worse as each succeeding coat is applied. This is unless proper care is exercised so as to do the painting in a room which is as free from dust as it is possible to make it. The room where the painting is done should be shut off by some sort of partitions from all other parts of the shop. Often canvas partitions are used, and are very effective. Stretch a heavy canvas over a light framework, and it makes a good wall against dust, providing it is run to the ceiling.

It is best to oil the floor of the paint room so that any dust will have a tendency to stick to it. Or, if this is not feasible, sprinkle it with water occasionally while doing the painting, so as to prevent dust rising due to walking around the job.

Lighting for Garage Workbench

One big mistake which a majority of the garages make is that they have not the proper lighting facilities so that the workman can see plainly what he is doing. Not only does it enable him to do better work, but it has a certain moral effect. Any one can do better work if he is able to see just what he is doing all the time, and does not have to guess whether he is putting some part together right or not. It is hard on anyone's patience to have to feel for a thing, or spend 5 or 10 minutes trying to get a nut or bolt to screw on properly by the sense of touch. It may often seem to the garage owner that he is paying a large light bill because he provides more lights than he might possibly get along with. But it is a good investment, for the better work it makes possible cannot help

Lighting of the Work Bench

but bring the customer back when again in need of repairs.

The workbench invariably should be placed along the windows of the repair room if there are any. On dark days, however, even this does not give enough light, and for such times, as well as at night, some such handy means as that shown in Fig. 2 of getting light exactly where it is wanted is to be recommended. On the backboard of the benches series of

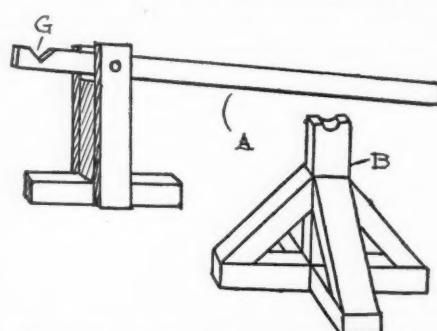


Fig. 1—Simple time-saving, quick-lifting garage jacks which are made easily

lamp sockets can conveniently be placed, connected in parallel as seen in the sketch.

These sockets can be screwed in at intervals of a foot or two feet, as done in a model garage just opened in Detroit. To give the best possible facilities for the men doing special bench jobs, several types of lamps fixtures are provided. There are portable lamps, A, and a couple of adjustable standard lamps B.

It should be noted that only very short extension cords are used to connect these lamps to the bench sockets. The idea is that the less loose wire there is around, the less chance for short circuits, fires and so on. Accordingly, when a man wants light at one particular spot, he plugs a lamp into the nearest socket, and does not have to drag a long line of wire to the point. In garages and machine shops especially loose wires that are dragged around soon get greasy and worn. The contacts get loose from constant handling

this way, and the whole thing is not any too safe where such volatile and readily ignitable materials as gasoline are used. Then, too, oil and greases disintegrate the rubber insulation, which in time almost drops off the wires. Many bad garage fires are chargeable to the short circuiting of loose portable lamp cords.

This same garage carries the permanent socket and short lamp extension idea still further by having sockets attached to the posts and side walls, so that almost any desired point may be lighted by bringing the lamp, with its short length of loose wire, to the nearest plugging-in point.

Wooden Jacks and Stands

A new garage just built took occasion to have one of the carpenters make for it a number of substantial wooden standards and wooden lifting jacks, as shown in Fig. 1. These were very simple to make, and they are time savers. Whenever a car must be raised either for a tire change, brake repair, or for any axle attention, one of the workmen quickly slips the jack A, under the axle, with some part of it in the groove G against slipping and after it is raised another man then places one of the standards B to receive the axle or the frame when the jack is let down. Standard B is provided with a groove also to fit some protruding part and prevent slipping. The whole procedure takes a remarkably short space of time, and the support is amply secure against any vibration or jarring to which the car may be subjected during the course of the repairing. Standards of some such form as that shown at B are to be preferred to most jacks, as they have a firm enough base to make tipping impossible. There are, however, many good jacks on the market which are made with a base of sufficient size to make a secure support. It does not pay to buy a cheap article of this kind which is not strong and has a poor base. Several instances are recalled where cars have had their axles badly sprung by the jack toppling over when the wheel was off, letting the chassis down suddenly at the point being supported. Rear axle housings are easily damaged this way if not secured properly.

Accidents of this kind are not always the fault of the jack. Often drivers use a size of jack which is too small for the car. Most jack makers specify the lifting capacity of each size they sell, and it is best to make sure the jack you use is adaptable to lift and hold the weight of the car.

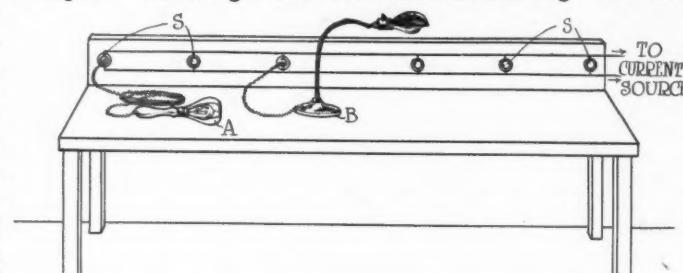


FIG. 2—METHOD OF OBTAINING EFFICIENT BENCH ILLUMINATION
Several types of lighting fixtures such as A and B are connected to the most suitable socket S



champion

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We furnish dealers with a line of Spark Plugs unmatched for completeness.

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We divide our profits with Dealers on an equitable basis in accordance with the service they render to us and to our consuming public.

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If you ever have any complaint about a Champion Plug, settle it on the spot. Here's

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We guarantee complete satisfaction to the user—free repair, replacement or money back.

If we have not sent you our Profit Sharing Agreement, write for it today.

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½ inch

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Price
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Stationary
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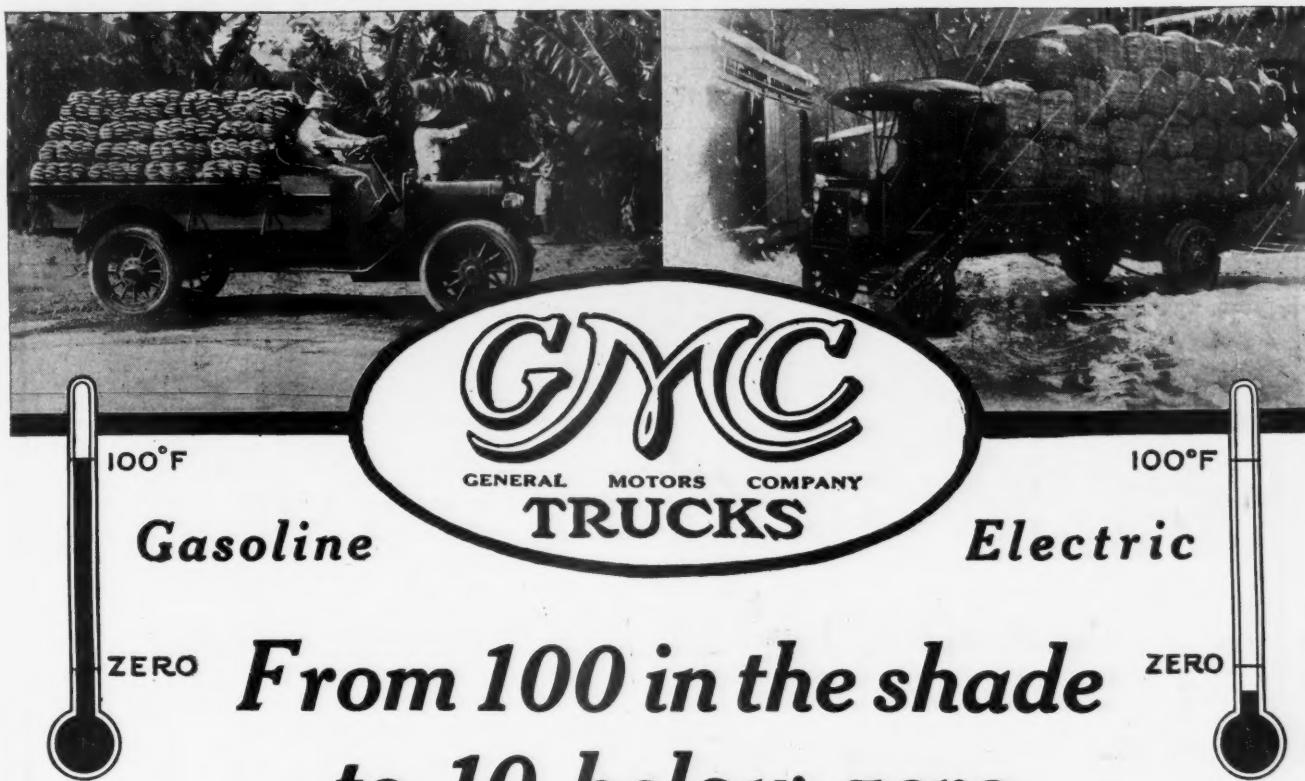
The Universal Carburetor

In the illustration a Schebler-Equipped Fire Engine is shown in action. In the choice of a carburetor for your car let yourself be guided by the judgment of those who deem the best obtainable just good enough. Demand SCHEBLER!



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Handling five-ton loads on snowy highways to displacing ox-carts in the tropics is a big step. But it shows the broad utility of GMC Motor Trucks. It indicates how they can be made to fit the service under widely varying requirements and working conditions.

And GMC Trucks "fit the service" because they are built with an understanding of the work they will be called upon to do. We make gasoline trucks from 1500 pounds to five tons in capacity and electrics from 1000 pounds to six tons. We build both worm and chain drive models. Each one of these trucks excels in some particular kind of work.

As pioneer builders of motor trucks and manufacturers of the only complete line of both gasoline and electric trucks in the world, we are able to tell you and sell you the type of truck best suited to your particular class of service. And the co-operation of our practical transportation men is available to you without cost.

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American Made for American Trade

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These Quality bearings are immediately available in quantity at our works in Bristol, and the excellence of our service is such, that ample stocks are now carried at our branch in Detroit and by New Departure Distributors throughout the United States.



Distributors

ALBANY	Albany Hardware & Iron Co.
ATLANTA	Elyea-Austell Co.
BALTIMORE	The Reus Bros. Co.,
BOSTON	Mt. Royal Ave. and Cathedral St.
BUFFALO	Ahlberg Bearing Co.,
CALGARY, ALB., CAN.	Iroquois Rubber Co.,
CINCINNATI	93 Mass. Ave.
CHICAGO	379-383 Washington.
CLEVELAND	The Chapin Co.
DENVER	Herman Bumiller Co.,
DES MOINES	Ahlberg Bearing Co.,
DETROIT	Chicago Pulley & Shafting Co.,
INDIANAPOLIS	Ahlberg Bearing Co.,
KANSAS CITY, MO.	Cray Brothers,
LOS ANGELES	Denver Auto Goods Co.,
MILWAUKEE	Quinn & McGill Motor Supply Co.,
MINNEAPOLIS	M. L. Foss,
NEW YORK CITY	Herring Motor Supply Co.,
NORFOLK	Ahlberg Bearing Co.,
OMAHA	INDIANAPOLIS Hearsey-Willis Co.,
PASADENA	Kansas City, Mo.
PHILADELPHIA	Motor and Machinists Supply Co.,
PITTSBURGH	Ahlberg Bearing Co.,
PORTLAND, ME.	Western Rubber and Supply Co.,
PORTLAND, ORE.	Julius Andrae & Sons Co.,
RICHMOND, VA.	Hudson & Thurber Co.,
ROCHESTER	Ahlberg Bearing Co.,
SACRAMENTO	The Gwilliam Co.,
SAIN T LOUIS	Machinists Supply Co.
SALT LAKE CITY	James Bailey Co.,
SAN DIEGO	Ballou & Wright,
SAN FRAN'SCO	Chemi Company, Inc.,
SAN ANTONIO	The Lininger Implement Co.,
SEATTLE	Western Rubber and Supply Co.,
SPOKANE	Fred Campbell,
SYRACUSE	Bertram Motor Supply Co.,
TACOMA	Western Rubber and Supply Co.,
TAMPA	Irvin Silverberg & Co.,
TORONTO	Western Rubber and Supply Co.,
	Woodward Carriage Co.,
	Ballou & Wright,
	Child, Day & Churchill Co.,
	U. S. Rubber Co.,
	Automobile Supply Co.,
	American Supply Co.,
	The Tire Import Co.,
	Avenue C & Third St.
	817 E. Pike St.
	1215 First Ave.
	212 S. Clinton St.
	755 South C St.
	610-20 Tampa St.
	130 Simcoe St.

THE NEW DEPARTURE MANUFACTURING CO.

Bristol, Connecticut, U. S. A.

Western Branch: 1016-17 Ford Building, Detroit, Michigan



Another Case of Nerves

When your storage battery turns up its toes and shows no signs of life, don't give it up for dead. Maybe it's just overworked.

Make an emergency call on the nearest Willard Service Station. There you'll find a doctor who knows his business. It may require a few days of careful nursing. Even an operation may be necessary. But if there's a chance to save your battery's life, why not go where experts are on the job? Then you're sure that you have done the best you could.

Willard Battery Hospitals are serving the makers, dealers and owners of 85% of American makes of electrically equipped motor cars. They all use Willard batteries.

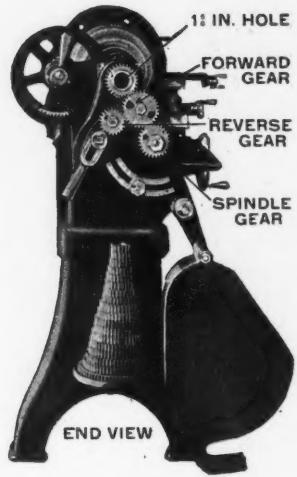
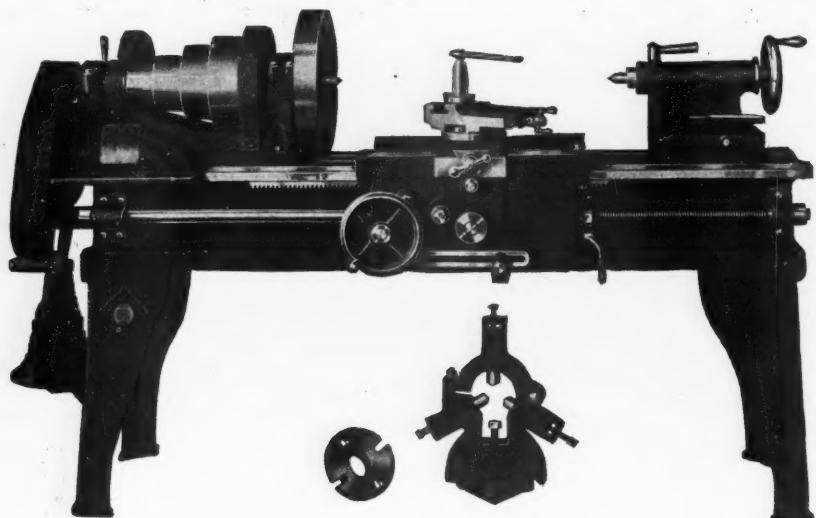
Willard Storage Battery Company
Cleveland, Ohio

New York Branch: 228-230 W. 58th St.
Chicago Branch: 2524-30 S. Wabash Ave.

Indianapolis Branch: 318 North Illinois Street

Detroit Branch: 738-38-40 Woodward Ave.
San Francisco Branch: 821 Monadnock Bldg.

Service Stations in All Principal Cities in the United States, Canada and Mexico



3 Machines for the Up-to-Date Garage 3

An 18 inch Lathe A 20 inch Drill A No. 2 Arbor Press

This new 18-inch Barnes Lathe swings 18" over bed ways; has 1 $\frac{5}{8}$ " hole in spindle; cuts threads 1 to 56; takes 3" wide belt on cone; large step of cone 10" dia.; has automatic cross-feed; 4 changes of feed in apron without changing gear. Workmanship and material of the best. Made in 6, 8 and 10-ft. beds.

The Barnes 20" Drill is too well known to require any comment. The No. 2 Adjustable Arbor Press is a machine for use in the Garage Repair Shop for pressing shafts into and out of pulleys, gears, hubs, etc., and for straightening automobile axles and frames.

A Lathe

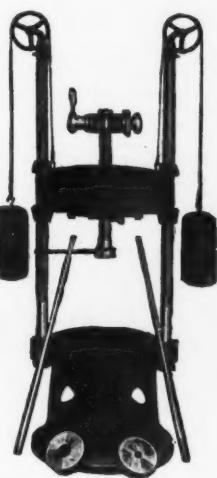
A Drill Press

An Arbor Press

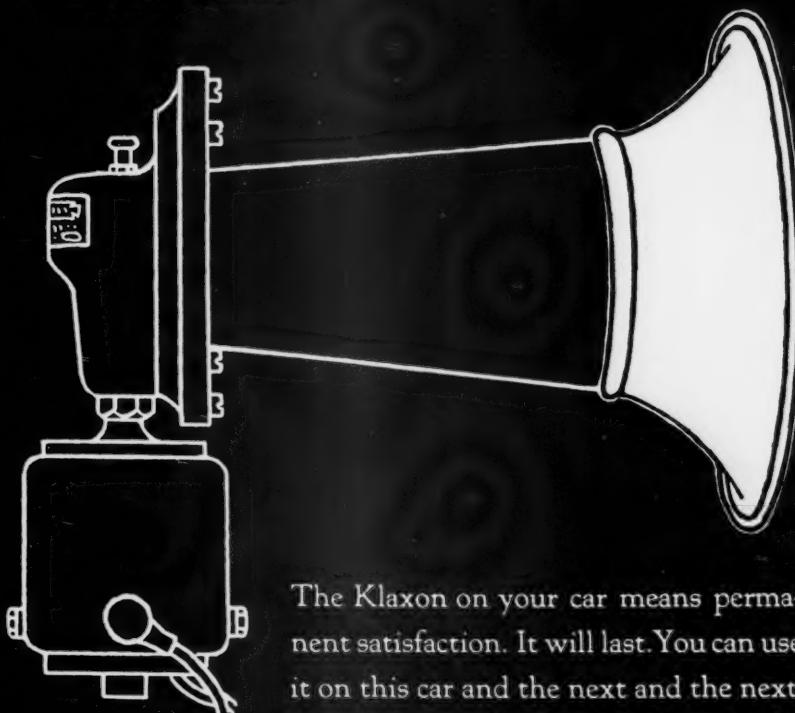
—3—

MADE BY

W. F. and John Barnes Company
444 Ruby Street Rockford, Illinois

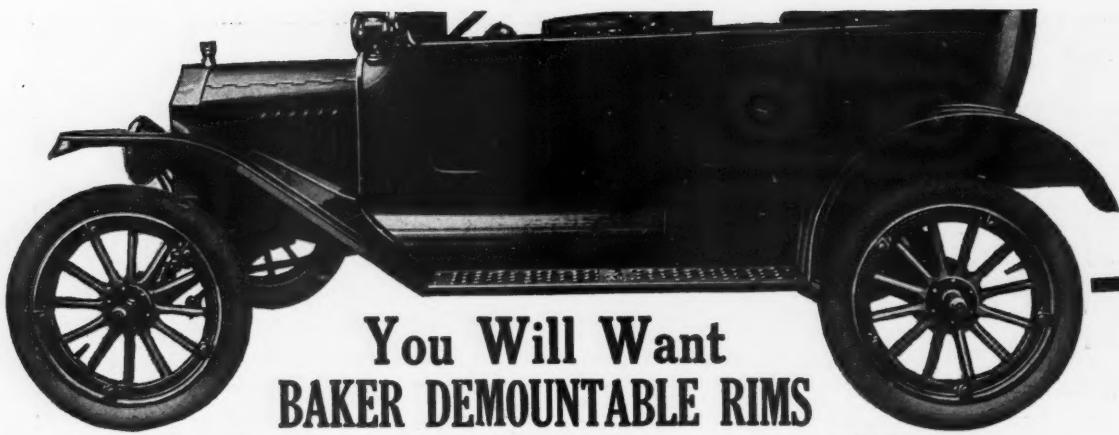


THE Type L is the largest of the Klaxons. It is the one you see on all high-priced cars. You can always tell it. The "right-angle" construction distinguishes it from all other signals. No other signal looks like it. No other signal sounds like it. Its loud, clean-cut, far-carrying note can come from it alone.



The Klaxon on your car means permanent satisfaction. It will last. You can use it on this car and the next and the next. It is guaranteed permanently—not for one year or two years or five years—permanently. You have the additional satisfaction of knowing, and of having all who see it know, that your signal is the best one possible to buy.

KLAXON
Type L'
\$20



You Will Want
BAKER DEMOUNTABLE RIMS
On Your New 1915 Stream Line FORD Car



**Entire Outfit
Only \$23.50**

With everything else brought up to time on your Ford, you can't longer bother with clincher tire changes. You can change your tires in 5 minutes, with BAKER Equipment—

The Only Quick Detachable and Demountable Ford Rims.

Three bolts do the work. No hard pulling or straining with BAKER Rims.

Four standard first grade Ford wheels—complete with genuine BAKER Demountable Rims—extra rim, and tools, all for \$23.50. *Fit any Ford car.* Get your outfit now.

Dealers—There are over 200,000 new Fords to equip this year. You'll need an early start. Write for BAKER DEMOUNTABLE RIM discounts.

UNIVERSAL RIM COMPANY, 1301 S. Michigan Ave., Chicago



**All Roads Are Good Roads
For Fords, STONE Equipped**

The STONE Shock Absorber measures the bumps, and takes up the shock before it gets into the car. You will find good roads made over night, when you first ride out with STONE Shock Absorbers on your Ford.

Try Them On Your Own Car—Absolutely Free.

See for yourself how much easier your car rides with STONE elastic joints in place of the Ford Spring Shackles. Figure how much longer your car will last with the lightened road strain assured by STONE Shock Absorbers. The free trial satisfies doubts. Get your STONE Equipment today.

Dealers—STONE Shock Absorbers sell fast—and at a good profit. Write for details and discounts today.



UNIVERSAL RIM COMPANY, 1301 S. Michigan Ave., Chicago

\$975



Announcing **EMPIRE** 1916 Model

Months ahead of all others in its announcement, a full year ahead in the value it offers, comes the 1916 Empire—Model 33 touring car. New models have no significance if numbers alone are changed—the Empire Model 33 is an advanced car throughout, the result of exhaustive experimental work and nearly a year's testing. We had not intended announcing this new model for months to come, but the demand of Empire dealers and customers took every one of our 1915 models before March 1—took every car we had to offer. This tremendous demand for Empire cars gives dealers and buyers the opportunity of securing this wonderful 1916 model this spring.

In this latest Empire are combined many new features. There is that attention to detail and body design and finish heretofore considered impossible in a car selling for less than \$1400.00. Size, power, quality and equipment, considered separately or collectively, make the Empire model 33 stand out above all cars of its class. It retains the sturdiness, ability, economy, and easy riding qualities that have made the Empire famous—and this now to an even greater degree. Note carefully these refinements:

Bigger in every way than any previous Empire—the wheel base is 112". No other car selling for \$975.00 has such length. This long wheel base with longer especially designed springs makes the latest Empire the easiest riding car in the American field.

Larger four cylinder motor developing 35 horsepower—increasing again the reserve power for which the Empire cars are noted. Weight well below 2,500 pounds, assuring economy of fuel and tires.

Left side drive with center control—greatest convenience for driver and passengers.

Streamline flush side body of extra roominess. As usual, this Empire already follows the latest advanced foreign design. The standard body color is Brewster green. New type upholstery of genuine leather affords maximum comfort.

Full floating single bearing rear axle—this construction takes all weight from the driving shafts and absolutely prevents oil reaching brakes.

Low center of gravity because of dropped frame, holds roads at all speeds—prevents skidding and tire wear thus caused. Standard road clearance maintained.

Study the above points carefully. Do you know of any car at less than \$1400.00 which combines such points of excellence? And they are but a few of the Empire's extra value features. Our literature brings out too many for enumeration here.

Dealers: Think of the advantage of having a 1916 model to offer your spring trade. This season the new Empire will be the most attractive car on the market for buyers. Many of our present dealers immediately doubled their spring specifications upon receipt of the first announcement of this car. This shows the trend of trade, what these men think of the new Empire. Our dealers' proposition is the most liberal offered by any manufacturer. Territory is going fast, but your district may still be open. There will be no delay on deliveries. Regular quantity shipments begin April 10. Write us today for particulars.

Five bow one man top—accurately described by its name. Five bow tops with inside quickly operated curtains have heretofore been limited to cars selling for several hundred dollars more than the Empire.

Remy electric starting and lighting fully guaranteed for one year—this starting installation requires no intermediate gears or clutches. It is especially silent and positive in its operation. No other car to our knowledge carries a manufacturers' one year warranty on its electric equipment.

Extra large, enameled rounded top honeycomb radiator—cells of expanding type prevents bursting in case of freezing.

Combination headlights—powerful searchlights for country driving, with small dim lights for city use and passing other vehicles—one of the highest priced American cars is the only other automobile using lamps of this type.

Detachable Sedan top at \$150.00 extra—the lowest priced top of this type on the market. Gives virtually two cars, an open touring body for summer use and closed limousine type for inclement weather.

EMPIRE AUTOMOBILE CO. INDIANAPOLIS U.S.A.

"Put on the

KINGSTON

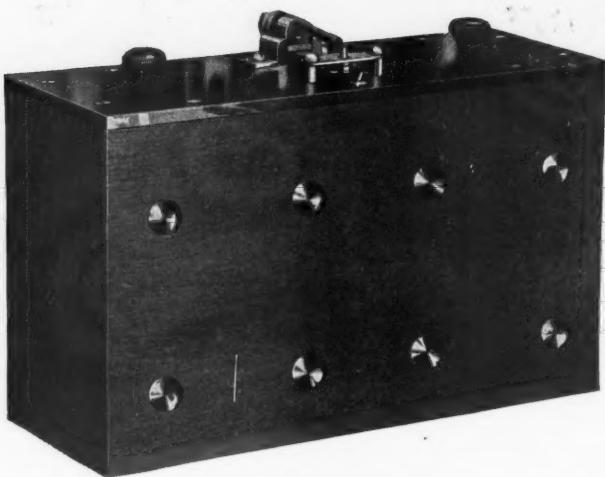
Single Vibrator Coil

and notice the difference"

Only One
Vibrator
Adjustment

A Perfect,
Even Spark
at Every
Plug

Why Use
Four
Vibrators
When One
Will Work
Far Better



for Ford 1914-15 Cars

It fits in the metal coil box used on 1914 and 1915 Ford Cars. Just take out the four vibrating units, slip in the KINGSTON Single Vibrator Coil and you are ready to go.

It will solve all Ford ignition problems. Easy starting. More power. That continual adjusting of vibrators is done away with. The spiral spring on the vibrator will not allow the contact points to stick.

The KINGSTON Single Vibrator Coil is also furnished in mahogany box complete with switch for older type Ford Cars.

Have you got your KINGSTON Single Vibrator Coil yet? THIRTY DAYS' FREE TRIAL. Write for particulars.

Kokomo Electric Co., Kokomo, Ind.

New York Branch
1733 Broadway

Los Angeles Branch
334 W. Pico St.

Detroit Branch
650 Woodward Ave.

Chicago Branch
1430 Michigan Ave.

Largest Manufacturers of Spark Coils in the World



Saxon Cars Are Breaking All Sales Records

THE Saxon roadster has established a record in sales never equaled by any other automobile. We have sold more cars than any other company ever sold in the same period after it started production. These sales are increasing; already large, they are more than doubling everywhere.

Saxon growth has been rapid—without a parallel. Within fourteen months we have increased our factory space 500 per cent. Our new plant is humming every day. We are working full capacity.

A Stylish Car

On the surface—and beneath—the Saxon is a stylish car. It is distinctive—individual. Its body is handsome—a genuine streamline effect. Its curves are graceful, its finish of high quality.

Saxon design and construction, too, are modern. The small bore, high speed type motor which Saxon was first to adopt is coming to be distinctly the vogue. Makers of highest priced cars in this country are adopting this type of motor.

Saxon uses a dry plate clutch, sliding gear transmission, honeycomb radiator, Atwater-Kent ignition—all evidence of its class and up-to-dateness.

The Modern Idea: Greater Service, Less Cost

The Saxon is modern for other reasons, too. It is the embodiment in a motor car of Efficiency and Economy, which are the order of the day everywhere. To get more service at a saving in cost—that's the modern idea. The telephone, the typewriter the cash register, the adding machine are examples familiar to all of us.

And the \$395 Saxon is as wonderful an efficiency machine, as epoch making in the benefits it can bestow on large numbers of people, as any of the above named modern day "wonders of the world."

To Dealers

Saxon cars offer better value at lower prices than any others. Therefore, they reach the widest possible market. The Saxon line for 1915 includes the new Saxon two-passenger car at \$395 and the Saxon "Six," fully equipped, at \$785. We have a limited amount of territory still open. Perhaps yours is. In writing for information please address Dept. M.

Saxon Motor Company, Detroit

Saxon Owners Testify

"I am sure the Saxon came through in much better shape than a larger car could have done. The trip was full of pleasure. The Saxon fulfilled every claim that is made for it."

Mrs. Emma Walsh,
Moline, Ill.

(Mrs. Walsh made a trip from Ft. Lauderdale, Fla., to Moline, Ill.—the longest trip on record by a woman owner in a Saxon car.)

"Although the roads (between Spokane and Republic, Wash.) were ankle deep in mud, the Saxon made the trip all O. K. The car walked right through. Gasoline consumption, 7 gallons; distance, over 200 miles. The Saxon is the right car for this country."

J. W. Rider,
Republic, Wash.

"I am making even better mileage than you promised. I have made 75 miles on two gallons of gasoline."

J. Hector Palmer,
Palmer, Mass.

"I have a 1914 Saxon which I have driven over the worst roads that can be found in the state for hills and mud. The car has always given perfect satisfaction."

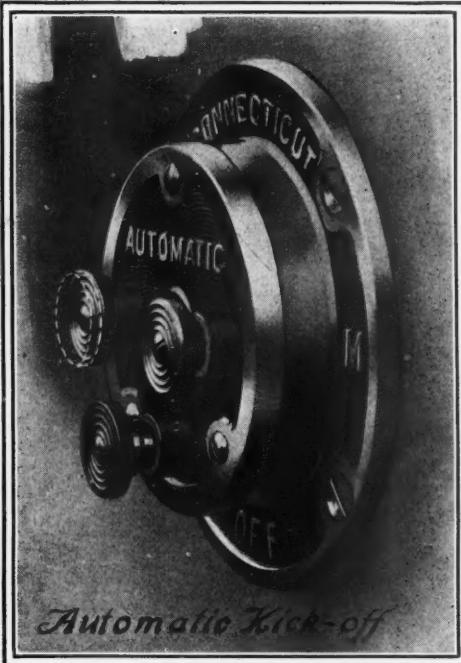
W. P. Keith,
Bar Harbor, Maine.

"Car operates perfectly. This is the second car I have owned in the last year. The first car covered 10,000 miles, and I cannot say too much for the Saxon."

Frank A. Fullerton,
Hastings, Nebr.

AN EFFECTIVE SPARK AT ALL SPEEDS

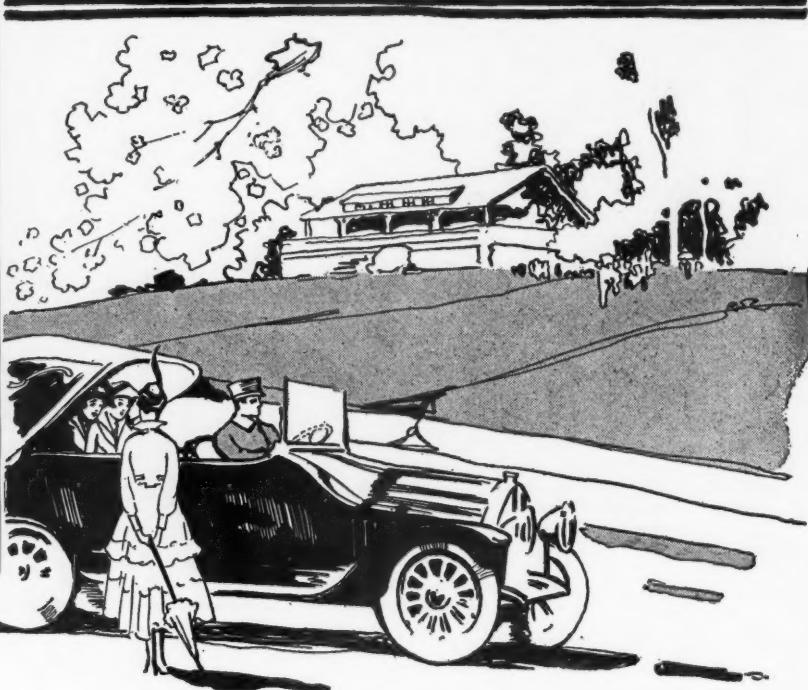
—A spark tempered to the motor's requirements—A spark that corrects the short-comings of carburetion—A spark that starts a motor firing without prolonged spinning and consequent drain on the storage battery.



Automatic Kick-off

Depress the upper left-hand button to switch CONNECTICUT AUTOMATIC IGNITION on.

Depress the lower button to switch it off—or, if you neglect or forget to do so, the Switch "kicks off" automatically.



Most motorists, whether owners of electrically cranked cars or otherwise, know from experience that a hot spark is the only thing that will eliminate starting troubles.

A hot spark can result only when the coil has a chance to become thoroughly saturated with electricity between successive breaks.

Due to the function of its automatic switch,

AUTOMATIC · IGNITION **CONNECTICUT**

can saturate its coil to such a degree even at the highest attainable speeds, that it delivers a more effective spark than the finest high tension magneto.

Inasmuch as the heat of a spark grows greater as the period of coil saturation increases, and inasmuch as that period grows greater as motor speed decreases, CONNECTICUT AUTOMATIC IGNITION delivers its hottest spark for starting and at slowest speeds.

**CONNECTICUT
MERIDEN**

TELEPHONE
& ELECTRIC

**COMPANY, Inc.
CONN.**

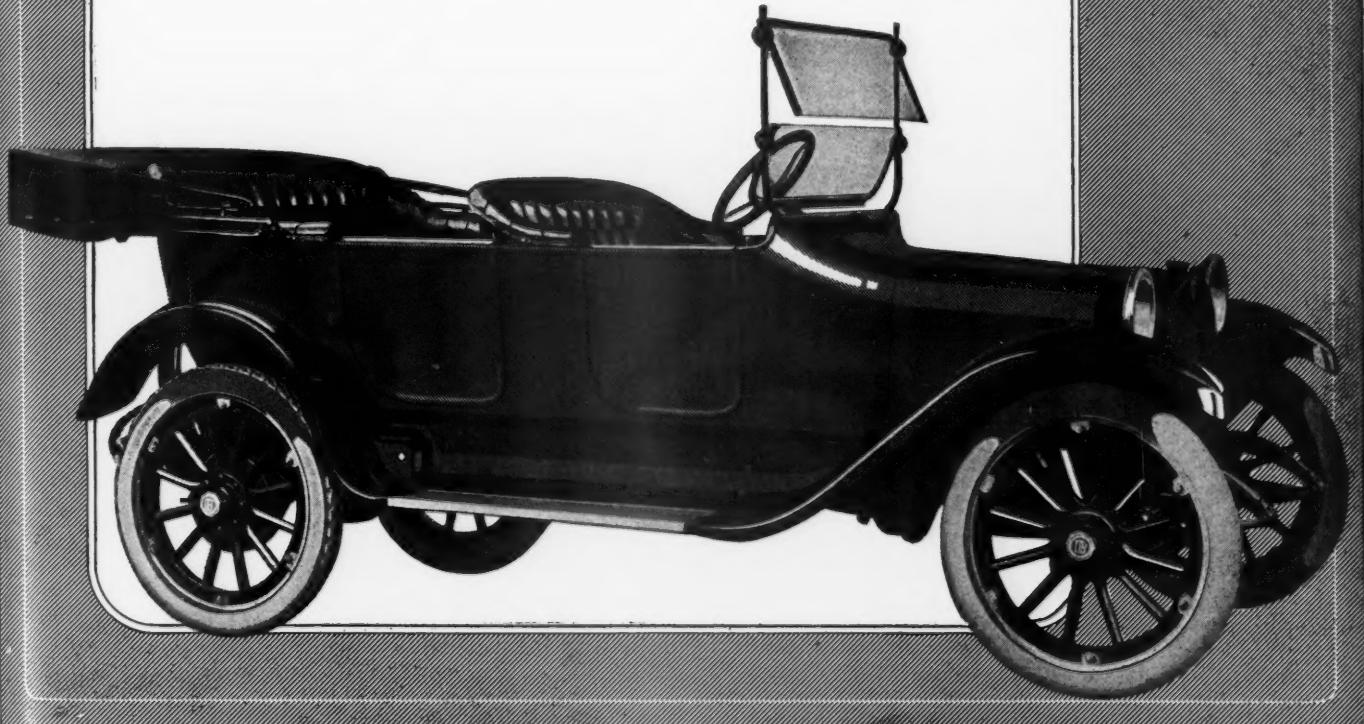
DODGE BROTHERS MOTOR CAR

There is a marked absence of vibration in the car, notwithstanding the unusual power of the motor.

There is no "choking" at low speed in high gear, and at full speed, there is scarcely a tremor from the motor. This exceptional smoothness evidences the fine engineering skill that has been employed in manufacturing and assembling the entire power plant.

The wheelbase is 110 inches
The price of the car complete is \$785
(f. o. b. Detroit)
Canadian price \$1100 (add freight from Detroit)

DODGE BROTHERS, DETROIT





Allen
Alter
Apperson
Atterbury
Auburn
Available
Bessemer
Bingham
Briscoe
Brockway
Buick
Cadillac
Cartercar
Case
Chalmers
Chase
Chevrolet
Clark
Cole
Coleman
Commerce
Corbitt
Crawford
Crow-Elkhart
Dart
Davis
DeKalb
Denby
Dort
Empire
Enger
Federal
Ford
G. M. C.
Gramm
Grant
Great Western
Halladay
Harder
Hercules

Hollier
Horner
Hudson
Hupmobile

Jeffery
Juno
Kelly-Springfield
King

McFarlan
Marion
Maxwell
Menominee

Modern
Mogul
Moline-Knight
Monarch
Monroe
Moon
National
Oakland
Oldsmobile
Overland
Packard
Palmer-Moore
Paige
Paterson
Pilot
Regal
Remington
Reo
Republic
Ritz
Ross 8
R.C.H
Sanford
Saxon
Signal
Stearns
Stegeman
Sphinx
Studebaker
Stutz
Touraine
Trumbull
Velie
Vim
Vulcan
Wescott
Wichita
Wilcox Trux
Willys-Utility
Zimmerman

FOUR MILLION
HYATT
ROLLER BEARINGS
IN 1915 CARS



A HYATT ROLLER BEARING WITH OUTER RACE CUT AWAY TO SHOW THE SPIRAL ROLLERS

All these well-known Automobiles and Motor Trucks are equipped with Hyatt Quiet Bearings in various parts of their construction.

Hyatt Roller Bearings were used in some of the first cars built and today those same makes of cars are running on Hyatt Quiet Bearings.

The increasing number of Hyatt Bearings used in all sizes and types of Motor Vehicles is only due to the wonderfully care free service rendered by them.

HYATT ROLLER BEARING CO.
DETROIT CHICAGO NEWARK N.J.

"HYATT QUIET BEARINGS"

Atwater Kent



Type K-2
Automatic
Spark Control

John Scott
Medal awarded
by the
Franklin Institute



to A. Atwater
Kent for
Improvements in
ignition devices

MAGNETO REPLACEMENT

TO meet the demand of car owners and dealers wishing to bring their cars up to date and to replace their magneto with Atwater Kent Ignition, we are now furnishing our type K-2 System with automatic spark control and our type H System (for use with regular spark lever) mounted upon a universal Magneto Base.

By means of this arrangement the Unisparker may be easily installed in place of any standard magneto.

Owing to the fact that this system requires but a small fraction of the power needed for the magneto, we have adopted a coup-

ling device which dispenses with the necessity for special couplings and fittings.

The car owner who has put up with the limitations of magneto ignition can not only improve the starting and slow speed qualities of his car, but can enjoy all the advantages of automatic spark control, flexibility and better acceleration now being experienced by a hundred thousand other enthusiastic Atwater Kent users.

When your car is Atwater Kent equipped you have the satisfaction of knowing that money can buy no better ignition equipment—and that your judgment is upheld by a large number of the foremost automobile engineers in the country.

Used as regular equipment by one-quarter of all 1915 U. S. A. built cars exclusive of Fords.

OWNERS
DEALERS
REPAIRMEN
JOBBERS
MANUFACTURERS

Interesting
information
for all.

FORDS: A Special
Atwater
Kent system that makes the
Ford engine a revelation.
Send for interesting booklet.

Atwater Kent Mfg. Works

4934 Stenton Avenue
PHILADELPHIA, PA.



Type H, for use with
regular Spark Lever

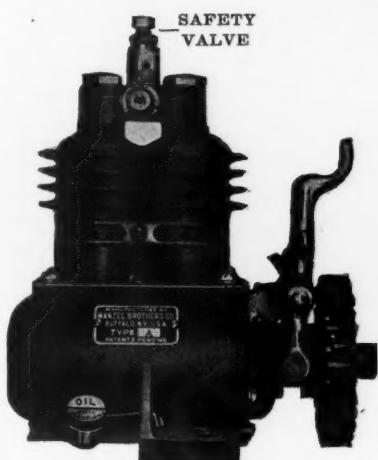
Have YOU "Little Fairies" Ball Bearings *On Your Car?*



The BEARINGS COMPANY OF AMERICA
Sales Department
250 West Fifty Fourth New York

APOLOGIES TO THE N.K. FAIRBANKS CO. AND ROSE O'NEILL
When Writing to Advertisers, Please Mention Motor Age

MANZEL ENGINE-DRIVEN TIRE PUMP



**We Carry in Stock
Fittings for the
Following Cars:**

Abbott-Detroit, 1912-13-14-15; Buick, 1910-11-12-13-14-15; Cadillac, 1909-10-11-12-13-14-15; Cartercar, R, 1912-13-14-15; Case, 1914; Chandler Six, 1914-15; Chalmers, 1912-14-15; Cole, 1913-14-15; Dodge; E. M. F., 1912; Enger; Franklin, 1914; Grant; Hudson, 1912-13-14-15; Imperial Six, 1914; Jeffery; KisselKar, 1914; Maxwell, 1914-15; Michigan, 1913-14; Mitchell, 1914; Moon; Oakland, 1912-13-14; Oldsmobile, 1915; Overland, 1912-13-14-15; Packard, 1914-15; Paige-Detroit, 1913-14-15; Rambler Cross Country, 1913-14; Reo, 1911-12-13-14-15; Simplex, 1912; Speedwell, 1913-14; Studebaker, 1913-14-15; Stutz, 1914-15; Velie, 1914-15; Westcott, and others.

The Manzel Two-Cylinder Tire Pump Fills Every Requirement

When we set out to manufacture the Manzel Pump we bent our energies to produce the finest kind of tire pump it was possible to make. We decided that we should have to design a pump that would

Be scientifically correct
Eliminate hand work
Properly inflate a tire
Be light and small
Not injure the motor to which it is bolted

Have sufficient capacity
Pump only pure air
Shut off air supply automatically
Be reasonable in price
Be worth an absolute guarantee

These were our Ten Commandments, and it was only by obeying them that we could make a pump that would come up to Manzel Standards.

We made it, and thousands of motorists the country over will bear witness that we have succeeded in the task we set for ourselves. The Manzel Two-Cylinder Engine-Driven Tire Pump sells for

\$20 Complete with all fittings, including 15 feet of air hose, pressure gauge, etc. **\$20**

It is workmanlike in the last degree—it has the same perfection of design, the same trueness of joint, the same high quality of material, the same splendid finish as you expect to find in high-grade motor parts.

We cannot emphasize these points too strongly, and our dealers are instructed to guarantee this pump in every particular.

Go to your dealer; get a Manzel pump; put it on your car; try it for 30 days, and if it does not do everything we claim for it, you'll get your money back.

Can you imagine a fairer proposition to insure absolute satisfaction with your purchase?

Manzel Brothers Company

*Leaders for 15 Years, in the Manufacture of Quality
Oil Pumps for Heavy Duty Steam and Gas Engines*

Factory and General Sales Offices

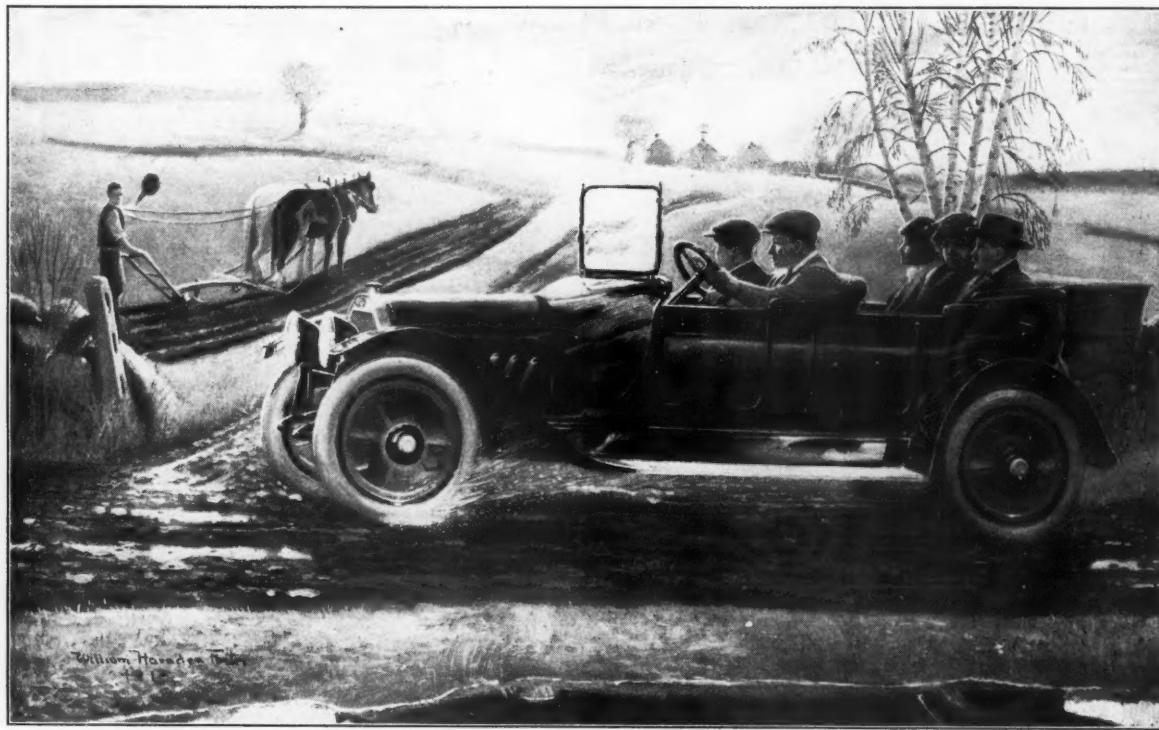
306 Babcock St.

BUFFALO, N. Y.

DISTRIBUTING CENTERS IN ALL PARTS OF THE UNITED STATES

Special FORD Model complete with 12 feet of hose, gauge and gears **\$7.50**

An always-ready engine-driven tire pump. Install it yourself—no holes to drill—no machine work to do. Once on it's on to stay.



We asked an automobile salesman for his opinion of Model 42. "I believe," he said, "that Model 42 looks from \$300 to \$400 better than any other car in its class,—without taking into consideration at all mechanical superiorities."

An Accurate Copy of our Big Six—a \$2975 Car

MODEL 42 lists at \$1285, yet compares favorably with \$2,000 and \$3,000 cars,—is an accurate image of the Big Six Oldsmobile.

It is light in weight, with five-passenger body and four cylinder valve-in-head motor, and does its work at small cost. Total weight 2500 pounds. Average fuel consumption 18 to 22 miles per gallon. Economical of oil. Easy on tires—most owners get considerably over the guaranteed mileage.

Every reader of Motor Age may have the illustrated story of this car. Kindly specify Booklet 104.

Established 1886 Incorporated 1899
OLDS MOTOR WORKS
LANSING - MICHIGAN

Oldsmobile

How to Get Service From Your Car

Correct diagnosis of its lubricating needs is the first essential. The use of oil that thins out, as many do, when the engine heats up will cause as much trouble as failure to replace the oil consumed.

Your motor must have oil that retains the correct body at its working temperature, that envelops every reciprocating part in a protecting film of oil, saving friction and excessive wear. Hundreds of thousands of owners have found it in

Polarine

FRICITION REDUCING MOTOR OIL

POLARINE maintains the correct lubricating body at any motor speed or temperature, whether the thermometer on the street registers zero or 100 degrees. No danger of burned-out bearings or scored cylinders, no annoyance from noisy operation. Friction reduced to a minimum. Double filtration practically eliminates carbon deposits.

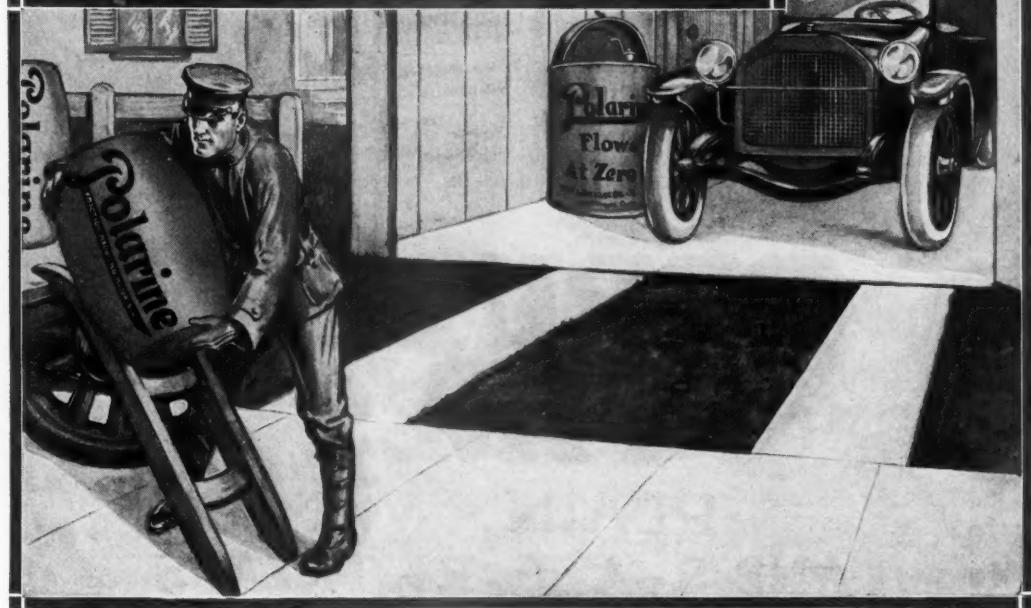
If you have your own garage you can make a big saving by buying POLARINE by the half barrel. You will use this quantity in a season's driving, so such an order is both an economy and a convenience.

POLARINE is made by the great organization whose watchword is service. Like every product, it is sold with the guaranty of satisfaction and may be had everywhere.

STANDARD OIL COMPANY
(AN INDIANA CORPORATION)
Chicago, U. S. A.

(298)

Red Crown
Gasoline
More Speed
More Power
More Miles
Per Gallon





*Republic Staggard Tread,
Pat. Sept. 15-22, 1908*

*Copyright 1914, by The
Republic Rubber Co.
Youngstown, Ohio*

"This famous tread is a great selling feature" —says Old Man Mileage

"It will win *new* customers for you—because thousands of motorists everywhere are telling other thousands of motorists of its wonderful non-skid efficiency, its *real* road service, its lowest-cost mileage. And because extensive national magazine advertising is carrying the same story to them, convincingly, continuously.

"Your customers will *stick*, too, because this tire will *make good* on the car—from every standpoint by which a tire ought to be judged.

Don't waste your time, money and effort in experimental propositions. Write us for the full details about this proposition of proved success, this demonstrated profit-maker.

REPUBLIC TIRES

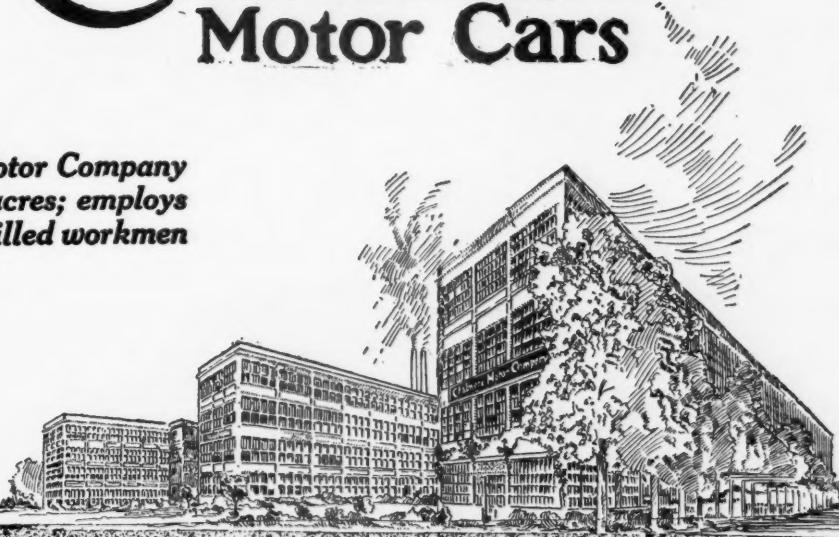
PLAIN, "WM"
AND STAGGARD TREADS

TRADE MARK REGISTERED
U S PATENT OFFICE

The Republic Rubber Co., Youngstown, O.
Branches and Agencies in the Principal Cities

Chalmers Motor Cars

The Chalmers Motor Company plant covers 30 acres; employs 4000 trained, skilled workmen



Quality

**On this Rock-Quality-I mean
to build my Business**

Hugh Chalmers Nov. 22 1907

Chalmers Models

New Six-40 at \$1,400 Light Six-48 at \$1,650 Master Six-54 at \$2,400

Chalmers Motor Company, Detroit



Quality First

Let your next Car be a Chalmers

MOLINE-KNIGHT

Dealers Forget Competition and Spend Their Time Making Sales

Moline-Knight quality, power and endurance have become an institution.

The Moline-Knight is recognized wherever motor cars are driven as a car of unusual capabilities—a car essentially for those who want "something different."

The Moline-Knight motor has created an everlasting prestige for itself and for Moline-Knight dealers that makes it one of the easiest sellers. Every Moline-Knight owner is an enthusiastic booster. You cannot find one dissatisfied owner.

The Moline-Knight is a "repeater." Once a man drives this famous sleeve valve motored car, he will never return to a poppet valve motor. He not only buys another for himself, but he inoculates his enthusiasm into those with whom he comes in contact.

Moline-Knight dealers are optimists. They forget competition and spend their time making sales. They have a host of indisputable arguments

which cannot be refuted by the dealer "across the street."

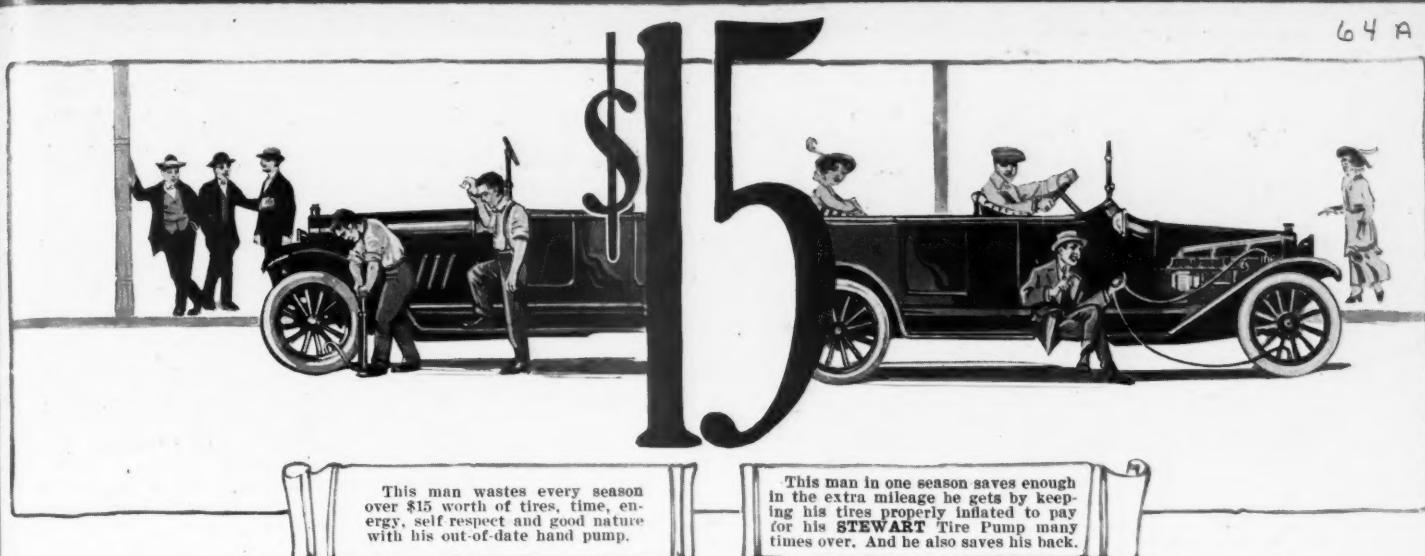
Instead of abusing the patience of a prospective buyer by wearisome reiteration of platitudes that have been thrown at him in rhetorical display since motor cars were made, the Moline-Knight dealer forgets the old jaded adjectives that mark the poppet valve salesman's talk, tells of 30 per cent more power, of the only motor that ever ran 337 hours under full load without a stop, places him behind the wheel and lets him "feel" the hidden power, lets him throttle down and "pick up" on high, shows him why there are no springs to weaken or break, no valves to grind and pound themselves out of shape, no carbon to decrease efficiency, and a "thousand-and-one" other proven facts that the poppet valve dealer cannot deny.

Dealers: Come to the factory, see this car, ride in it, and we will absolutely prove that the Moline-Knight "50" at \$2500 and the Moline-Knight "40" at \$1475 are cars that will build for you a lasting trade.

Moline-Knight "50"
128 in. wheelbase, 4 forward speeds, spiral bevel gear rear axle, 30x4½ in. tires, completely equipped—\$2500.

Moline Automobile Co.
East Moline, Illinois, U. S. A.

Moline-Knight "40"
118 in. wheelbase, 3 speed selective transmission, spiral bevel gear rear axle, 34x4 in. tires, complete equipment, \$1475.



Don't let \$15 stand between you and everlasting freedom from hand pumping!

\$15 is a mighty small amount for freedom for life from hand pumping—the hardest and most disgusting job about a car. \$15 is all a STEWART Tire Pump costs—and it will start paying for itself on the first long trip you take.

Just think of it! Get a STEWART and never again *as long as you run your car* will you have to sweat over pumping a tire. You—your arms, legs and back—have got to work *with* a hand pump. The STEWART Tire Pump does the hard work *for* you.

And the first season you use the STEWART Tire Pump it will pay for itself many times over in the tire bills it saves. Under-inflation sends more tires to the scrapheap than any other cause. Tire manufacturers say 90% of all tire trouble is due to under-inflation. You can't inflate a tire to proper pressure with a hand-pump. It is a physical impossibility. Stop and consider that you can pump all *four* of your tires to standard pressure, and *keep* them there, with a STEWART in less time than it takes to pump *one* tire by hand—and then you have guessed at its pressure.

Be sure to ask your dealer for a STEWART Tire Pump—and get it. Look out for the *cheaper* pump and the "just as good" pump.

You don't want a BIG pump. You don't need one. You want a pump of reasonable size—a STEWART. It doesn't cost so much as a bigger tire pump. It won't strain your motor. It doesn't require a lot of lubrication. It won't overheat, sending rubber-corroding oil vapor into your tires. It won't blow out the hose. But it will pump a tire fast enough for anyone—has the job finished by the time you've got your tools put away.

\$15 Complete

Can be put on any car, old or new, by anyone. Try one for 30 days on our offer of money back if not satisfied.

If you want GUARANTEED RELIABILITY don't get a pump having any intake valve. Intake valves are always liable to leak. STEWART Tire Pump has no intake valve. Thus we have eliminated the worst feature in a tire pump.

Don't buy a pump having but one outlet valve. In the STEWART Tire Pump two outlet valves are supplied—one to safeguard the other. Should dust or any foreign substance get under ONE valve, the other valve holds the air, and enables you to get 100% efficiency.

The piston of the STEWART Tire Pump is lubricated by rubbing against an oil-soaked wick. NO SURPLUS OIL IS GIVEN OFF TO BE PUMPED INTO THE TIRE AND ROT THE RUBBER.



Can be put on any car—old or new.



Don't buy a Warning Signal that's Vertical, downward

\$ 5

—Unwise to
Pay Less



Don't consider ANY warning signal until you have investigated the exclusive features of the STEWART. Remember the STEWART Warning Signal requires only the pressure of a finger on the plunger. No physical effort required at all.

Take advantage of our 30-Days' Free Trial offer—your money back if not satisfied. Learn WHY the STEWART Warning Signal is outselling all others.

Why is all this stampede for the STEWART Warning Signal?

Why is it people don't want anything but the STEWART?

Makers of other Warning Signals have cut their price to \$10; then they cut it to \$7.50; and now they are cutting it almost in two. And is price the only thing that's being cut?

But they haven't done the one thing that we did—they did not put the highest quality into their instrument.

They didn't make the best warning signal because they didn't make it the STEWART way.

They have changed their price—they have changed their design—they have done a lot of advertising—WHY HAVEN'T THEY GOTTON THE BUSINESS?

Why is the STEWART Warning Signal selling at nearly 1500 a day now? Simply because the STEWART Warning Signal at \$5 cannot be duplicated IN QUALITY by any other company—no matter what price they might ASK for it.

The STEWART Warning Signal works on the direct downward stroke—the only **correct** principle. The slight pressure of your finger does it. No physical effort necessary.

You don't have to bend your wrist to operate it! You don't have to draw back and push forward your arm to operate it! You don't have to lean sideways and "dig down under" to get at it!

QUICKNESS OF OPERATION is imperative in a warning signal. In an emergency you haven't time to waste with unnecessary movement. Only ONE movement—a natural, easy, downward stroke of hand or elbow, or pressure of finger tip—is required to operate the STEWART. This movement is almost instinctive.

Other devices which require arm, wrist and body movements, slow up in getting your signal into action—fatigue you, and make hard work of a very simple matter. Any signal which is hard to "get at" is dangerous.

Stewart

that is operated any other way is Stroke —

The STEWART Warning Signal, unlike some types of signals, can be operated by use of arm or elbow without taking one hand off the steering wheel—an invaluable convenience in a tight pinch.

Warning devices which necessitate a backward and forward swinging movement of the arm frequently cause the whole body to turn when the signal is operated. As a result the hand controlling the steering wheel is likely to be sharply jerked—and the car's course abruptly and dangerously changed. The motorist whose arm movement is often considerably hampered by a heavy overcoat, or his wrist movement hindered by stiff or thick driving gauntlet, finds the STEWART downward stroke method of operation most safe and most satisfactory.



Selling
1500
a day

EASE OF OPERATION is a distinct advantage of the STEWART Warning Signal. The slightest pressure on the big flat plunger top (which you can't miss) results in a sharp warning blast. No effort is required.

You can't buy a better signal for more money, nor so good a signal for less. \$5 was our very first price. We did not have to skimp quality of material, workmanship or design to reach this price. Already the success of this horn is a repetition of our STEWART Magnetic Type Speedometer, of which there are now over 1,300,000 in use today.

We knew that the STEWART Warning Signal as we were designing it could not become other than the leader, and was sure to sell in such tremendous quantities as to justify the low price of \$5 from the very start. A warning signal of this high quality, made in lesser quantities than we knew we would be required to produce it, would have justified a \$10 price.

Insist on these STEWART features: The STEWART Warning Signal bell-shaped projector is made of brass, which is more costly than steel, and gives a clearer and more penetrating sound.

The extra large diaphragm is of highest grade Swedish steel.

The bracket is *double*, supporting signal at two points, and holding it absolutely rigid. It can never rattle. The swivel bracket directs signal blasts straight ahead. These two features alone mean the success of the Warning Signal and can be found only in the STEWART.

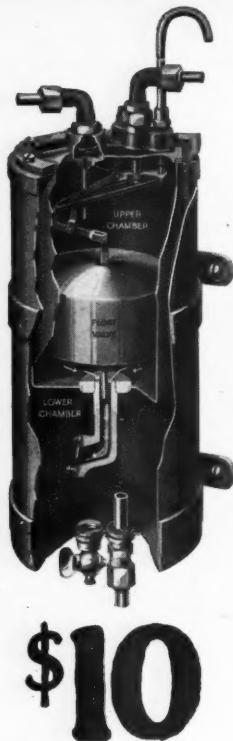
The felt pad oiler retains the oil and lubricates properly, without waste, nuisance or frequent oiling. Lubrication requires little or no attention.

Gears are wide-faced and are cut, not stamped, from the highest grade steel, and case-hardened. They are carried in a frame with each gear mounted on double bearings, each bearing mounted in a hardened steel bushing. This insures positive alignment, ease of operation and eliminates wear.



We can't make STEWART Warning Signals fast enough! We have already tried to add two stories to our new 7-story factory before it is finished, so as to increase our output to meet the tremendous demand for STEWART products.

Warning Signal



\$10

Can be put on any car,
old or new. Works absolutely automatically. Requires no attention. Try one for 30 days on money-back basis. Ask the dealer.

advances made in the history of the motor car. Already standard equipment on over 91 makes of quality cars. 100,000 cars already equipped. Thousands being sold to car-owners everywhere.

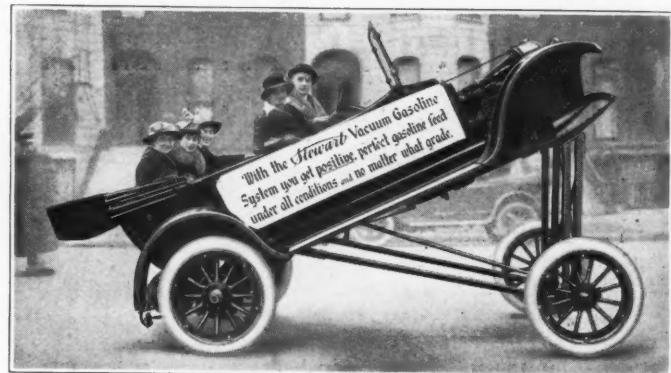
The biggest \$10 worth obtainable in the way of a motor car necessity. Saves 15% gasoline—and shortly pays for itself. Eliminates every trouble and annoyance of old-fashioned gravity and pressure-feed systems. Eliminates hand pumping of air into gasoline tank before starting car. All air-leak troubles of pressure feed systems done away with.

You will experience no more gasoline feed troubles if you put on the *Stewart* Vacuum Gasoline System

The photograph below shows an Oakland car equipped with the STEWART Vacuum Gasoline System, tipped at an angle of nearly 45 degrees, and running under its own power. The idea of this test was to prove that even under these exaggerated conditions the STEWART Vacuum Gasoline System would supply a positive, AUTOMATIC, even flow of gasoline to the carburetor.

The angle at which this car is tilted is the same angle at which, according to "Engineering Table of Grades," gravity overcomes traction. No car could climb a grade so steep.

The STEWART Vacuum Gasoline System is one of the most noteworthy



Oakland car equipped with STEWART Vacuum Gasoline System demonstrating automatic, positive gasoline feed under all conditions, and regardless of grades. Could you do this with a pressure feed system? Could you do this with a gravity feed system?

A uniform, positive flow of gasoline guaranteed. No gasoline forced wastefully through the carburetor, causing an over-rich mixture, sluggishness and carbonization, and it works absolutely automatically—you don't have to give it a thought.

You don't need to remove any part of your old gasoline system to put the STEWART on your car. Get a STEWART Vacuum Gasoline System NOW, and add to the pleasures of motoring another time, trouble and money saving feature.

A Quality STEWART Magnetic Speedometer for Ford Cars.

Over 100,000 bought by Ford owners alone in eight months. Only one moving part. Outlasts the car. 60-mile rotating speed dial—10,000-mile season odometer—100-mile trip odometer. Try one for 30 days on our offer of money back if not satisfied.

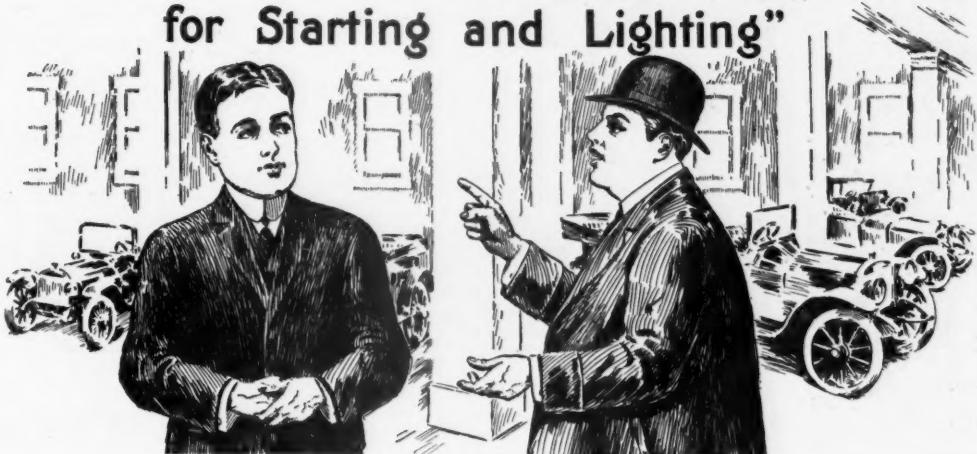


Stewart-Warner Speedometer Corporation

Executive Offices: 1932 Diversey Blvd., Chicago Factories: Chicago and Beloit, U. S. A.
Boston Buffalo Chicago Cleveland Detroit Indianapolis Kansas City Los Angeles
Minneapolis New York Philadelphia St. Louis San Francisco London Paris

78 SERVICE STATIONS IN ALL CITIES AND LARGE TOWNS

"I'LL BUY on condition that you
equip with **GOULD BATTERY**
for Starting and Lighting"



Who has the best judgment, "A" or "B"?

"A" took the starting and lighting battery that was handed him. Mr. Dealer made a fine profit, but soon Mr. A noticed that his cranking power would die down suspiciously quick. In winter the battery had to be "boosted." Acid crept out and corroded the terminals. One cell wouldn't equalize with the others, and like a weak chain link, pulled down the whole capacity. During the trouble periods, Mr. A found that hand cranking was no lost art.

"B" said "none but a Gould Battery goes on my car, even if the cost is a little more." Three years later he was able to conscientiously tell a friend, "My battery still works as well as when I bought it and I've never yet used the crank. Battery troubles simply don't exist with me."

The question of judgment here is intensely practical.

A good battery is essential to motoring comfort and assurance that your car is always ready.

Batteries built to sell at a price can't be expected to give service. We prefer to build for service—and Gould Battery users agree that we do it.

Gould
Storage Battery

Gould
Storage Battery

Gould Storage Battery Co.

Genl. Offices, 30 E. 42nd St., New York



Works at
Depew N.Y.

Boston, 347 Newbury St.; Philadelphia, 613 Lincoln Bldg.; Cleveland, 1761-5 E. 18th St.; Detroit, Kerr Bldg.; Chicago, 225 E. 22d St.; San Francisco, 1448 Van Ness Ave.; Los Angeles, 118 E. Pico St.
Agents in Washington, Rochester, Buffalo, Pittsburgh, Milwaukee, Minneapolis, St. Paul, Kansas City, Omaha, Denver, Topeka, Seattle.

CANADIAN REPRESENTATIVE:
R.E.T. Pringle, Toronto, Montreal, Winnipeg, Vancouver.
Full stock of parts, plates and repairs carried by
all offices and agents.

145

FEDERAL

**In every detail of construction
Federal Tires have Extra Strength
assuring Extra Service**

Federal Tires are the only tires made with Double-Cable-Base. The strong double steel cables, imbedded in the base close down to the rim, permit the use of a soft and flexible bead-filler which *cannot* cut and grind into the side-walls of the tire. For this reason there are

No Blowouts Just Above the Rim, No Rim-Cutting

These strong steel cables *anchor* the tire firmly to the rim, so that it cannot rock. For this reason there is

No Tube-Pinch and No Danger of Thrown Tires

Equip your car with Federals this year and get the Extra Service that comes from all this Extra Strength.

RUGGED TREAD

Real Scientific Protection Against Skidding

In the Federal "Rugged" Tread you get a value far beyond the selling price. It is a *scientific* non-skid tire. On any kind of roadway, no matter in what direction the wheel tends to slip, the same required number of rugged studs are on the job to *stop it*—gripping the road tenaciously.

Federal Double-Cable-Base Tires are made in all styles and sizes. "Rugged" and Plain Treads

**Federal Rubber Manufacturing Co., Milwaukee, U.S.A.
Branches, Distributors and Service Stations in All Principal Cities. Dealers Everywhere**

STRENGTH



There is just one reason, fundamentally, that Sheldon Worm Gear rear axles under actual working tests show from 94% to 97% efficiency—that is 94% to 97% of power generated ultimately delivered to the rear wheels at road contact.

That reason is, that,

Sheldon axles are designed and built solely with the idea of delivering greatest efficiency—not with any idea of selling bearings.

Because we know from every conceivable test that ball bearings alone will properly care for the worm thrust load we use ball bearings for that purpose. Because we know beyond any question that the semi-floating type of axle is the superior to any other type we use semi-floating.

Because we have designed these axles looking only to efficiency.

And because we build to that design with the sole idea of quality and results only, we are able to show the ultimate consumer economy both in original purchase as well as in operation.

This in spite of the fact that Sheldon axles originally cost more than others.

THE SHELDON AXLE & SPRING COMPANY

Makers of Springs and Axles for Heavy Duty Service for More than 50 Years

WILKES-BARRE, PENNSYLVANIA

Chicago:
122 S. Michigan Blvd.

Detroit:
1215 Woodward Ave.

San Francisco:
444 Market St.

TO THE TRADE

Very often we receive letters from our subscribers requesting the names of manufacturers making cars, parts and accessories.

Class Journal Co.

239 West 39th St., New York City

Gentlemen:—I have your publication "Motor Age" of January. I wish to take up the sale of American cars, hence would ask you to give me, if possible, a list of houses that are not represented in France or that wish a representative for Southern France, with headquarters at Marseille. I shall be especially interested to know of houses that furnish trucks capable of carrying 1000 to 2500 kilograms (2200 to 5500 pounds) net load.

If necessary I can give references and bank guarantees.

Also kindly state where I can find your publication in France.

Hoping to hear from you, I remain

Very truly yours,

(Signed) Name on request.

These letters will be published from time to time and the name and address of the inquirer will be mailed on request.

This letter from a dealer asking for pleasure car and truck agency for southern France, his bank references are ready—

Are You Interested?

ADDRESS—ADVERTISING DEPARTMENT

THE CLASS JOURNAL COMPANY

910 S. Michigan Ave., Chicago

239 West 39th Street, New York City

There Is a Sparton for Every Car

\$4 to \$15

Model
"D"
Sparton



THERE is quality to the speaking voice of a Sparton Horn. It calls to everyone along the road with a clear, distinctive note. Its voice is "cultivated."

The diaphragm of every Sparton Horn is carefully hand hammered by a skilled workman until it has the right vibration to carry the clear, strong Sparton note.

SPARTON SAFETY SIGNALS

Made in one quality but of many designs and sizes.

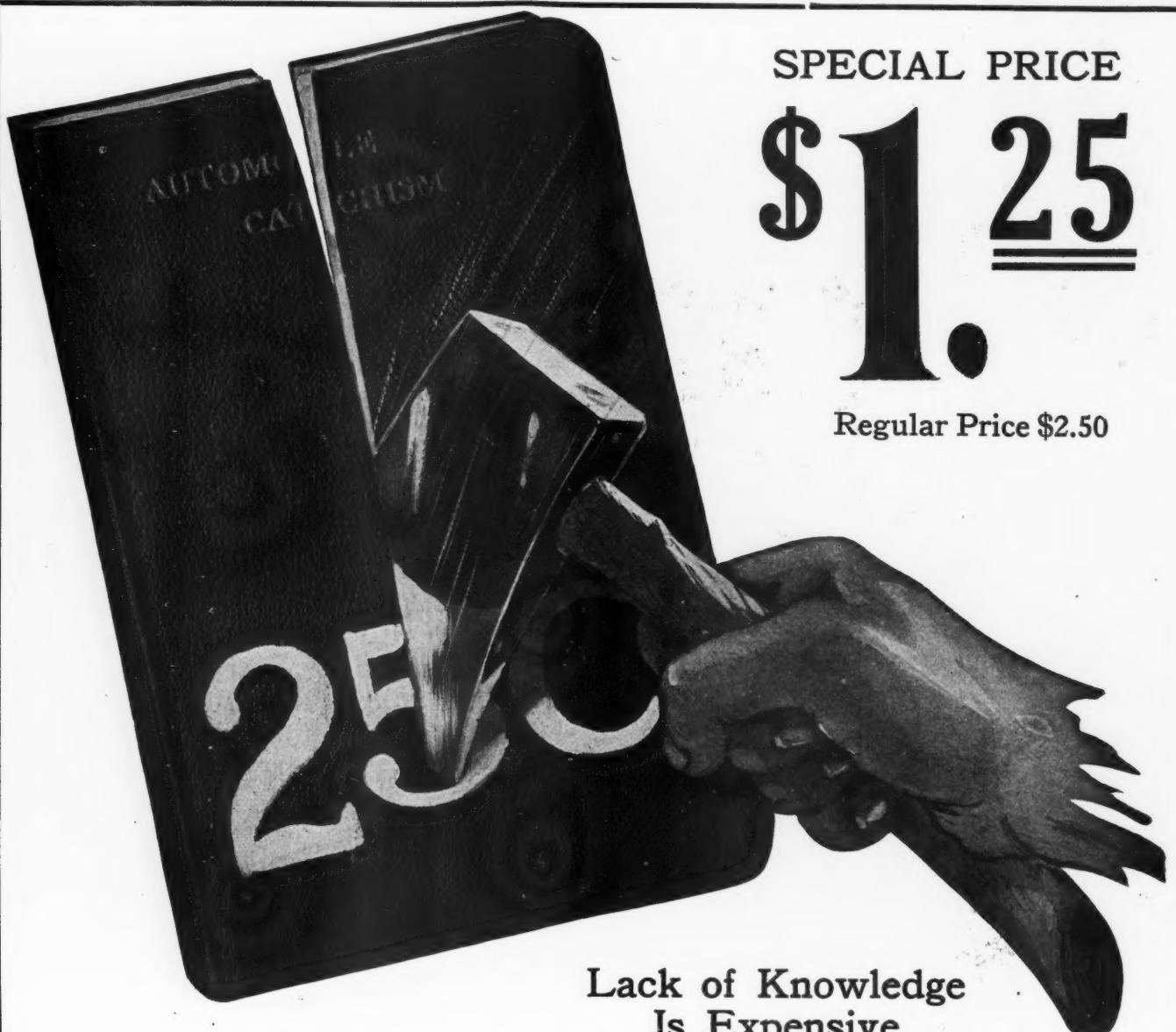
90 per cent of all American cars equipped with motor driven horns use Sparton Horns.

The Sparton hand operated horn is an exceptional value.

There is a Sparton to fill every need as low in price as \$4.00 up to \$15.00 for the large electric model.

In buying your car see that a Sparton Horn is part of the equipment. Call at any dealer's, and ask to see the various models of both electrical and hand operated Sparton Horns.

**The Sparks-Withington Co.
Jackson, Michigan**



SPECIAL PRICE

\$1.
25

Regular Price \$2.50

Lack of Knowledge Is Expensive

THE AUTOMOBILE CATECHISM" (de luxe edition) is a complete course in automobile instruction—each subject discussed and illustrated so that YOU will grasp every point worth while—every subject is made as simple as A B C. You are interested—you are instructed—you are directly benefited. Its information is final.

It's a handsome piece of book work—splendidly printed, with 101 illustrations; flexible black leather binding, rounded corners and gold-edged pages—beautiful, while being intensely practical. It will be to your immediate financial advantage to acquire an intimate and practical knowledge of cars and their parts.

We want every reader of Motor Age to have a de luxe copy of "The Automobile Catechism." To make our offer irresistible we have decided, FOR A LIMITED TIME ONLY, to CUT THE PRICE IN TWO. This half price (\$1.25) will prove the best investment you ever made. Remember, this is the de luxe edition—264 pages—every page full of real, money-interest value.

Put your name and address on the corner coupon, tear from the page, enclose \$1.25 and mail today to—

THE CLASS JOURNAL COMPANY,
910 S. Michigan Ave., Chicago, Ill.

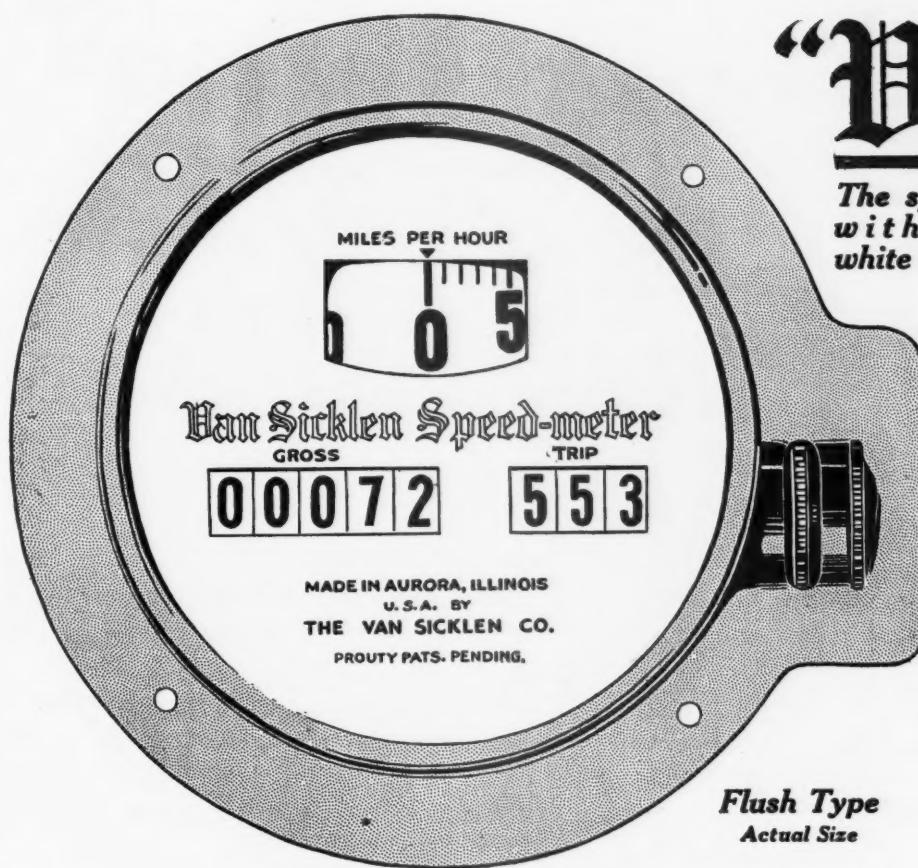
Gentlemen: Enclosed please find \$1.25, for which send me a copy of "The Automobile Catechism" (de luxe edition).

Name.....

Address.....

THE CLASS JOURNAL COMPANY

910 S. Michigan Ave., Chicago, Ill.



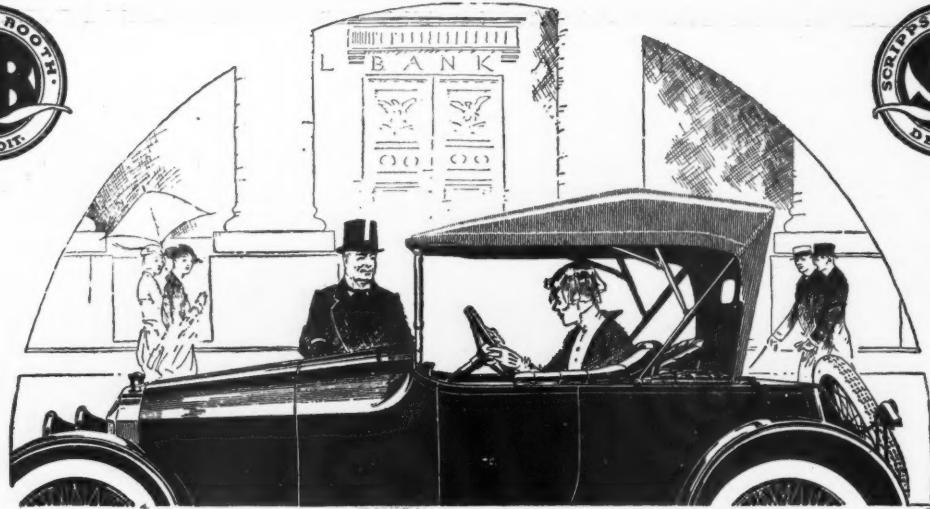
CHEVROLET—“The Product of Experience”—now carries **Van**—the choice of concerns of experience—right up front on the dash as standard equipment.

Van's big, generous smile, unquestionable truthfulness and faculty for keeping out of trouble, are qualities as pleasing to the makers of cars as to those who ride in them.

THE VAN SICKLEN COMPANY
AURORA **ILLINOIS**

Factory Representatives: Cutting, Armstrong & Smith Sales Co., Detroit, Mich.

General Distributors: The Beckley-Ralston Company, Chicago



Scripps-Booth

contrasts a foreground of luxury, finish, beauty and maximum quality in light car construction with a background of dignity, business stability and pride.

The car is a masterpiece of engineering and art-psychology. Investiga-

tion shows a remarkable organization backed by an intense pride in the product it is producing.

The Scripps-Booth is the present day answer to the motor car problems of 1915.

Our salesrooms will convince you.

SCRIPPS-BOOTH COMPANY, DETROIT, MICHIGAN

COMFORT WITHOUT EXTRAVAGANCE

HOTEL WOODSTOCK

WEST 43d STREET
JUST EAST OF TIMES SQUARE :: :: NEW YORK

360 ROOMS

265 BATHS

**EUROPEAN
PLAN**

**COURTEOUS
ATTENTION**

**HOMELIKE
ATMOSPHERE**



**MODERATE
PRICES**

ROOMS
With Use of Bath
For One, \$1.50 & \$2.00
For Two, \$2.50 & \$3.00

**ROOMS
WITH BATH**
For One, \$2.00 to \$3.00
For Two, \$3.00 to \$4.00

**SUITE
TWO ROOMS
& BATH**
\$6 to \$8

WIRE FOR RESERVATION AT OUR EXPENSE

W. H. VALIQUETTE, Manager

A. E. SINGLETON, Asst. Manager

Electric Auto-Lite

STARTING - LIGHTING - IGNITION



*These new additions to the Auto-Lite factory contain
150,000 square feet of floor space.*

THE rapidly growing demand for AUTO-LITE starting and lighting systems has forced us to make still greater factory enlargements.

To our present plant we have just added two large buildings, one of which is 304 feet long, 80 feet wide and 4 stories high.

In five years our factory has grown from one small room to the largest plant of its kind in the world.

Our daily output is now more than 500 complete outfits, including light generators, starting motors, switches, lamps, horns and tire pumps. This number will soon be increased to 1200.

These facts need no further comment.

The Electric Auto-Lite Company

Home office and factory: Toledo, Ohio

New York

Detroit

Kansas City

San Francisco

PATENTED
**Peerless
Piston Ring**

For
Automobile
Motorcycle
Aeroplane
Marine
Motors
Steam
Engines
Compressors
Pumps
Etc.

Maintains Compression

The Peerless One-Piece Piston Ring

—is designed to, and actually does, maintain compression absolutely without leaking.

PEERLESS Piston Rings are of the one-piece type—universally accepted as standard—with the additional advantage of a simple and effective patented lock joint.

They are made of close grain gray cast iron. The scaly inner surface retains the natural elasticity of the casting. The top, bottom and outer surfaces are accurately ground to 1-1000 of an inch of specified dimensions.

The rings are *eccentric*, allowing a uniform pressure on every point of their periphery.

Carbonization, overheating, and a smoking motor are prevented by keeping surplus oil out of the combustion chamber.

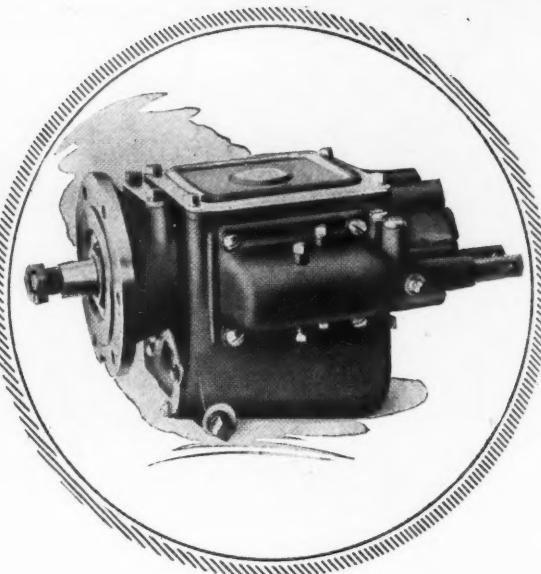
This one-piece ring can be put on a piston as easily as the old-fashioned style.

Money Back If Not Satisfactory

The **PEERLESS** is a perfect piston ring—and it sells for less than others, on a money-back guarantee. A trial will pay. Get yours today.

Dealers—Write for particulars now. **PEERLESS** Piston Rings are money makers.

LARSON & HILKER, Distributors
401-19 S. LASALLE ST. CHICAGO, ILL.



Warner Gear Co. Transmissions

For
Perfect
Service

"The Recognized Standard"

LEADING MANUFACTURERS OF
**DIFFERENTIALS
TRANSMISSIONS
STEERING GEARS
CLUTCHES**

WARNER GEAR CO.
MUNCIE, IND.

DETROIT OFFICE, 967 Woodward Avenue

Through the Tube to the Tire!

Countless motorists who have found the answer to the Tire Question in Miller Tires first used them because of the excellent service they had received from Miller Tubes.

Miller Red Tubes

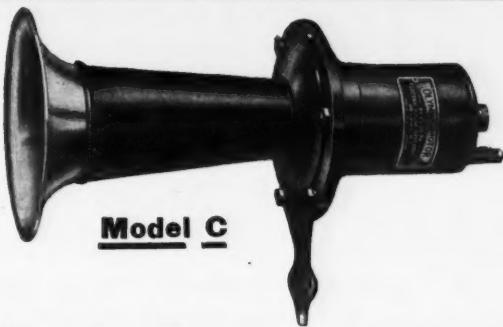
Give you a feeling of security and freedom from Tube troubles because they are built of pure gum by the careful Miller Method. They are heavy and strong, yet so exceptionally elastic that they do not lose their shape. Double reinforcement at the valve, by means of a large strong base, gives additional protection where wear is most severe.

The Miller Dealer has the size tube you need. Have him show you these strong, highly elastic, serviceable tubes.

**The Miller Rubber Co.
Akron, Ohio, U. S. A.**



OLYMPIC HORNS



Model C

Olympic Motor Driven Horn

has a brain and a conscience that is built into it. A slight pressure on the button brings a firm request to step aside; a longer pressure will send its cyclonic voice a mile ahead. It needs no care or attention for a year or more. If a readjustment is necessary, it can be accomplished without taking the horn apart. Three dry cells will operate it and five dry cells develop its full power.

Our confidence in its excellence is backed by our guarantee to replace every defective OLYMPIC MOTOR DRIVEN HORN with a new one within a year after purchase and keep it in good order indefinitely.

Price \$5.00 Under Hood Type Model D
Price \$6.00 Outside Dash Type Model C



Model B

Olympic Electric Horn

is of the vibrator type. 75,000 of OLYMPIC ELECTRIC HORNS are standard equipment on some of the best cars this year and only ten of these horns were returned for repairs. We, therefore, guarantee it the same as our MOTOR DRIVEN HORN.

Price \$2.50 Under Hood Type Model B
Price \$3.00 Outside Dash Type Model A
OLYMPIC HORNS are fully covered by patents and do not infringe any other makes.
Write for our interesting proposition to manufacturers, jobbers and dealers.

**ELECTRIC SPARK APPLIANCE COMPANY
140 Imlay St., Brooklyn, N.Y.**

**THE F. E. CASTLE CO.
Western Distributors**

872 Woodward Ave. Detroit, Mich.



BOSCH



THE low selling price of the car you buy or sell is no argument that its ignition system should be less reliable than the best.

The Bosch Magneto may cost the car makers a trifle more per car, but the difference is so slight and the importance of ignition so vital that any argument of the "can't afford it" or "it's just as good" nature is completely refuted. It is highly advisable to insist that the car you buy or sell, is Bosch-Equipt.

Correspondence Invited

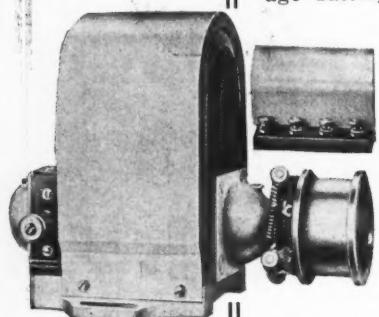
BOSCH MAGNETO CO., 214 West 46th Street, New York

Chicago—Detroit

Over 250 Service Stations

San Francisco—Toronto

**TECO
SPECIAL
for
Ford Cars**



**Ready
to Install**

**Price
\$20**

The Teco Electric Lighting System

—is the best assurance of a storage battery, always charged—and electric lights ready to give efficient service at all times, under all conditions.

The Teco Storage Battery Charger

—operates whenever your motor runs. Automatic electric cut-out prevents over-charging, or discharging when motor is dead. TECO has current output of 7 amperes at 10 volts.

For automobiles—especially Fords and all motor boats.

Write today for catalog

Dealers and Jobbers—It pays to handle the TECO line. Wire for discounts.

The Tritt Electric Company
Union City Indiana

**Absolutely Guaranteed
for 3 Years
Money-Back
Basis**



**Better
than all
the rest**

We advertise our horn to you as "better than all the rest," because we know that at \$3.50 it—

Costs Less

than the others, and is the only horn on the market at that price that can profitably be guaranteed on a money-back basis for 3 years. Our horn throughout is a **quality horn**—and it **always works**. Order yours today. You judge its merits—\$3.50.

Dealers—The trade wants our horn. There is money in it for dealers. Get your sample now at special dealers' price.

Service Motor Supply Co.
Washington Blvd. and Desplaines Street
Chicago

\$3⁵⁰



"It's All in the Coil"

It's the coil of rope around the tree that holds the bull. The harder he pulls, the tighter the rope coils and the greater is the resulting friction.

It's the same way in driving your car equipped with Snubbers. The bigger the bumps, the tighter the layers of belting will coil around the center spring, and the greater will be the frictional resistance against rebound of springs and car body. Snubbers automatically exert just the right amount of resistance against spring rebound, to ensure practically the same easy riding on rough roads as on smooth roads. *Do you get that?* Write for Booklet.

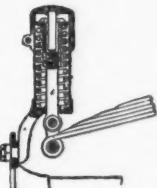
GABRIEL HORN MFG. CO., 1415 E. 40th St., Cleveland, Ohio.

\$9 A SET OF 4 FORD
"O-G" SHOCK ABSORBERS **\$9**
*For Ford Delivery, Touring Cars
and Runabouts*

Adjustable when placed on the car, and automatically adjusted in service. Can be attached in fifteen minutes.

Sold with a guarantee that covers workmanship, material, finish and satisfactory service during the use of car.

The above illustration shows method of attaching to rear of Ford car. Bearings of fine material, lubricated grease cups, there can be no rattle or squeaks.



This illustration makes clear the method of attaching the front "O-G" and shows the large amount of spring action possible. By twisting the cap, the spring in the absorber is tightened or loosened, giving the necessary increase in spring tension.

*Immediate refund if the "O-G"
Shock Absorbers do not prove to be entirely satisfactory.*

Write today for particulars

OXYGEN GENERATOR COMPANY
301 RIVER STREET

Complete Generating and Decarbonizing Outfit for

\$15.00

Sold with complete equipment, extremely economical to operate and guaranteed in every particular.

A generator not too large for a small garage or shop, but with capacity great enough for the largest.

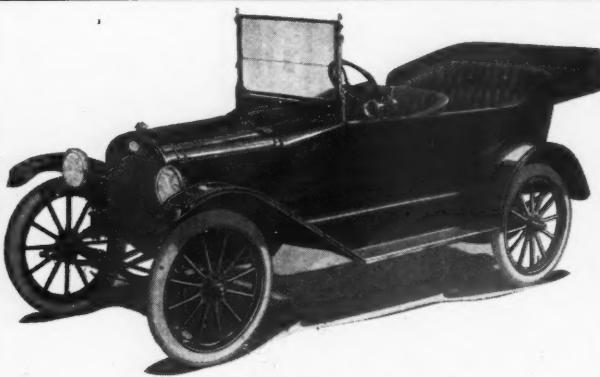
No tanks to bother with, no delay in securing material. A practical equipment that can be operated by any one.

Carbon can be removed from any cylinder in three minutes.

Oxygen can be generated in three minutes.

It is a time, money and labor saver.





METZ 66 25⁹⁹

The Quality Car

A GREAT BIG PROPOSITION FOR DEALERS

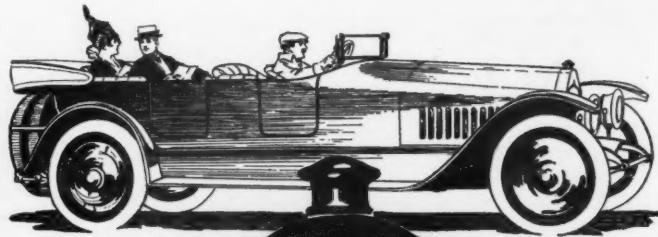
This new Metz Touring Model will help you to do a much bigger business, and a very profitable business. The demand for just such a car as this will show a greater increase this year than ever before.

Listed at \$600, its equipment includes Gray & Davis electric starter and electric lights, rain-vision windshield, one-man top, luxurious upholstery, 32-in. wheels, 3½-in. Goodrich clincher tires, Bosch magneto, Hyatt bearings, gasoline gauge, speedometer, signal horn, tools, etc. It is a handsome appearing car, a car any owner will be proud of, and so simple in operation that a woman can safely drive it. It will pay you to handle the METZ.

Write for particulars and New Catalog "K"

METZ COMPANY

Waltham, Mass.



National

All's Well Behind this Radiator!

THIS distinctive radiator is a time-honored guarantee that "all's well" with the car behind it.

In the world's fiercest contests it has been this distinct radiator, sighted far down the track, that has so often heralded another *National* victory.

When the man on the curb sees this radiator on your car, he credits you not only with good taste, but with sound judgment, for the beauty of the *National*'s performance is as superior as its beauty of appearance. Fifteen successful years of car building warrants your confidence in the *National*. The *National* owner knows his car is full value at \$2375.

National Motor Vehicle Co., Indianapolis



Road Smoothers

Reg. U. S. Pat. Off.

Quickly applied to your Ford Car

Give You Ford Car Advantages with big heavy Car Comfort

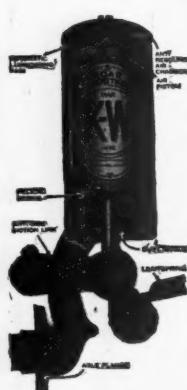
In Buying, Here's What You Must Look for in Order to Combine Comfort, Safety and Economy.

1. A spring to effectively take up the shock.
2. An anti-rebound air chamber to check the rebound.
3. Anti-side motion links to prevent side rocking and swaying.
4. No frictional wearing surfaces.

But you can find all of these vital factors *only* in K-W Road Smoothers!

But after all's been said and done, it's results that count; and the K-W guarantee covers not only workmanship and material but *results* as well.

Sold by dealers who know the difference everywhere. If your Dealer can't supply you, send prepaid upon receipt of price. Write for booklet, "Taking Out the Bumps."



\$15 Set of Four
One for Each Wheel

HEADLIGHTING
OUTFITS

THE KW IGNITION CO.
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CLEVELAND, OHIO, U.S.A.

SPARK COILS
SPARK PLUGS

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Statement for April 1, 1915, of the Ownership and Management of MOTOR AGE, published weekly at Chicago, Ill., required by the Act of August 24, 1912.

Editor, C. G. Sinsabaugh, 910 S. Michigan Ave., Chicago. Managing Editor, David Beecroft, 239 W. 39th St., New York. Business Manager, E. E. Haight, 910 S. Michigan Ave., Chicago.

Publisher, The Class Journal Company, 910 S. Michigan Ave., Chicago.

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E. E. HAIGHT, Business Manager.

Sworn to and subscribed before me this twenty-fourth day of March, 1915.

[Seal] EDNA F. McNULTY, Notary Public.
(My commission expires September, 1915.)

The Part Determines The Whole

Unless the metallic brushes are of the highest quality, the motor of which they are a part, is inferior.

SPEER

Metallic Brushes

—are used on motors of the highest quality. Grade Metal B has shown its superiority in repeated competitive tests, both as to allowable current density and minimum wear of brush and commutator. It will distribute 200 amperes per square inch, continuously. Liberal dealers' discounts.

WRITE

Speer Carbon Co.
Saint Marys
Pennsylvania



PATENTED



The New Appliance For Headlights

KLEARGLOW is the latest and most improved device for its purpose. Originated in Switzerland — popular throughout Europe. Made entirely of scientifically designed, corrugated glass surfaces. Takes away the glare that causes so many motor car accidents — so many smashed cars — yet does not absorb any of the power furnished by the lamps, as with dimmers and similar devices. KLEARGLOW casts all the light all the time. "Dimmers" are dangerous — KLEARGLOW is safe. KLEARGLOW does not have to be removed when making country trips, in order to obtain enough light.

KLEARGLOW

The Auto Light Diffuser

gives all the *safe light without the dangerous glare*. Lamps equipped with KLEARGLOW conform to the varying laws of different localities covering automobile headlights. KLEARGLOW prevents the arrest and fine of owner or chauffeur, saving much expense, loss of time and unnecessary annoyance.

You ought to put KLEARGLOW on your car now. Fits any car and goes in place of present headlight glass. Will make your car look better. The moderate price — \$3.75 per set — is really an investment — for it is proof against injury to person and damage to car as well as police interference due to common headlights.

Our interesting illustrated folder points the way to better and safer motor trips. Tells about our fifteen-day trial offer — we make KLEARGLOW "prove up" before you buy. Just drop a post card for the folder TODAY. Address

To JOBBERS and DEALERS:

KLEARGLOW is a *real* sales promoter. It is a motor car necessity that sells easily. Ask us about our unusual proposition for you.

H. G. PARO

765 Michigan
Boulevard Bldg.
Chicago, Ill.



The AERMORE

Exhaust Horn

Polite Yet Effective

Can be heard a block or a mile. It pleases the ear whether blown low or loud. Just the horn you want. Here are the reasons:

Musical Sound—Built on the principle of a pipe organ. Four notes, blown at once, produce perfect harmony.

No Upkeep—First cost is only cost. Made of brass tubes, nickel-plated. Nothing to wear out.

Reliable—Cannot clog. Cannot be tampered with when car is standing.

Clears the Way—Amply warns but does not frighten.

Easy to Put On—Nothing shows but the foot pedal.

Get it from almost any dealer. Price \$5.50 to \$7.50 complete. Every horn guaranteed. Sold direct where no dealer does not carry it. Descriptive folder sent on request.

The Fulton Company
727-729 National Ave., Milwaukee, Wis.



ENGINE SALE

REDUCED ENGINE PRICES FOR QUICK SALE

BRAND NEW STOCK MODELS

Carrying our regular guarantee

will be SACRIFICED to save moving from our
Peru, Indiana, factory to our new
plant at Pittsburgh

SINGLE ENGINES OR QUANTITY

MOTORS ONLY OR UNIT

POWER PLANTS

4 CYL.—4 CYCLE

3 1/2 x 4 1/2

4 1/2 x 5 1/2

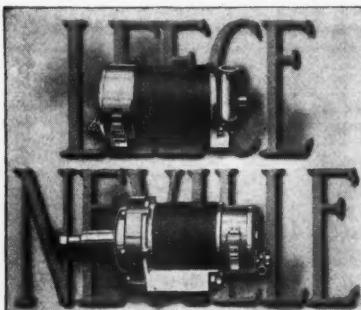
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WRITE OR WIRE
Pittsburgh Model Engine Co.

HOMWOOD STATION
PITTSBURGH, PA.

ENGINE SALE



**ELECTRIC
STARTING
and
LIGHTING
SYSTEM**

See It on Haynes Cars

THE LEECE-NEVILLE CO., Cleveland, O.
(50)



Price
\$1.00

Removes and replaces the most stubborn tire in three minutes. For use on all clincher tires.

For Sale by Dealers Everywhere

STEWART ACCESSORIES COMPANY

820 W. Warren Avenue Detroit, Michigan

Lexington

CRITERION OF ITS CLASS

Thoroughbred Six—\$1875 Famous Four—\$1375
Six Supreme—\$2575

All equipped with the Moore Multiple Exhaust

*Write for Details and
Co-operative Dealer Proposition*

The Lexington-Howard Co. Eighteenth Street, West
Connersville, Ind., U. S. A.

STROMBERG
CARBURETOR
"The Accepted Standard"

The New Stromberg Carburetors make records for Economy, Power, Acceleration and Smoothness of Running.

Write for Information

Send us make and model of your car and we'll tell you which new model Stromberg is best adapted for it.
STROMBERG MOTOR DEVICES CO., Chicago, Ill.

When Writing to Advertisers, Please Mention Motor Age



**BROWN Jr.
Tire Pump**

**NEW PRICE With Gauge
and "T," \$5.50**

Built like a motor with lapped rings. A high grade pump at a small price for medium size tires. You cannot afford to run your car without this pump.

SEND FOR LEAFLET—
JUST OFF THE PRESS

The Brown Co., 120 Bellevue Ave.,
Syracuse, N. Y.

EISEMANN

The most simple—the most accessible—the most durable—the most efficient magneto ever produced is the new Type G-4.

The Eisemann Magneto Company
Sales and General Offices,
32-33d St., Brooklyn, N. Y.
New York, N. Y. Indianapolis, Ind. Detroit, Mich.
245 W. 55th St. 415-417 N. Capitol Ave. 802 Woodward Ave.

**OSGOOD
AUTOLITE
DEFLECTORS**



have experienced a tremendous demand. More dealers are desired—also local managers in every city and county to extend distribution. Attractive proposition. Hurry! Ask for particulars.

This glareless glass fits any automobile headlight. Deflects rays without diminishing light. No glare. Avoids accidents. Equally good for city or country driving. Nothing else like it.

Endorsed by Chicago and other municipal authorities where glaring headlights are condemned. Retail \$5 the pair. Money-back guarantee. If your dealer cannot supply you, order direct.

OSGOOD AUTOLITE DEFLECTOR COMPANY
Dept. 12, 404 First National Bank Building CHICAGO

HORN and FAN Combined



OAKES

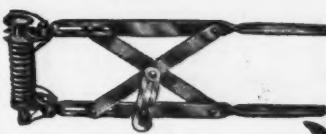
No gears, motor, batteries or wires to give trouble. Gives warning signal by merely pushing button at driver's seat. Increases efficiency of fan and motor. Keeps radiator cool. Never fails to sound. Long life. Is easily interchangeable with fan on any Ford in a minute's time. Most reliable and safest horn. Write for dealer's proposition.

The Oakes Co.
INDIANAPOLIS



**Single Unit
Electric
Starting
and
Lighting
System**

Famous for Power and Non-Stalling Efficiency. Catalog on Request.
DYNETO ELECTRIC CO., Syracuse, N. Y.
Send Us Your Electrical Problems



**Remove Valves
Quickly and Easily**

with the ILLINOIS VALVE REMOVER. Most practical tool for the purpose ever constructed. Durable—simple to operate—always ready. A real time and temper saver. Every motorist, garage and repair man should have it.

The Illinois Valve Remover

is fully described in our free illustrated folder. Low priced—just \$1.00. You ought to know about this remarkable device—so write now. Address

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It contains descriptions of all the famous Campbell Guaranteed Motor Car Accessories; Detachable Upholstery, Percama, Straps, Boots, Accessories for Fords, etc.

Territory open for reliable established dealers

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624 Broadway, Cincinnati, O.
New York Office, 89 Chambers Street



BRAENDER
TIRES and TUBES
are famous for their QUALITY

We wish to announce that irrespective of action by any other organization

Braender Quality Will be Maintained

Braender Net Prices to Car Owners

Tires.	Plain.	Non-Skid.	Gray Tube.	Red Tube.
30 x 3	9.00	10.35	2.35	2.60
30 x 3 1/2	11.60	13.35	2.70	3.00
36 x 4 1/2	27.35	31.45	5.20	5.80
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BRAENDER RUBBER & TIRE CO.
Main Office & Factory, RUTHERFORD, N. J.
New York, 250 West 54th Street
Agents in principal cities

**THE POWERFUL, SILENT
SPHINX**

\$695

A REAL AUTOMOBILE

The lightest, strongest, most serviceable and economical machine of its kind ever built.
112 inch wheel base. Electrically started and lighted.
Sphinx Motor Car Company, York, Pa.

4 Cyl. 35 H. P.
\$1185

6 Cyl. 50 H. P.
\$1585



Built to Endure!

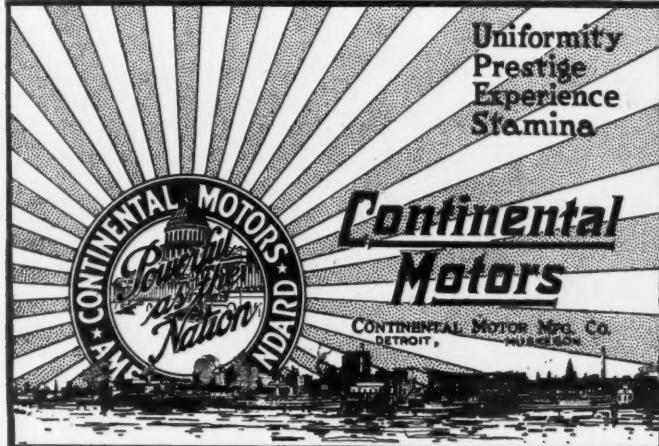
WESTCOTT MOTOR CAR CO.
Richmond, Indiana



See the new enclosed Ford cars
The Coupelet, a luxurious two-passenger car, and the five-passenger Sedan, a roomy, stylish family car. Prices of the Ford line; Coupelet \$750, Sedan \$975, Runabout \$440, Touring Car \$490, Town Car \$690 f. o. b. Detroit fully equipped.
Ask nearest Ford branch or dealer about Ford profit-sharing with retail buyers.

Ford Motor Company

Detroit, Mich.



BOSTONSTARTER
For FORD CARS

• Fully Guaranteed. • Does the work. • Cost—a fraction of electric starting cost. • No harm to car; does not interfere with cranking in usual manner. • Releases in case of backfire. • Retards spark automatically before starting. • Time tried success—no experiment. • Be sure you get the BOSTON STARTER. • Ask the Ford dealer or your dealer or write.

Boston Starter, Boston Mass.

DOUBLE SEAL TIRE VALVE



No tool needed to seat or remove Valve

Interchangeable with all Stems

Fifty Cents Per Dozen
Single Valves, Five Cents



DOUBLE SEAL TIRE VALVE CO.
1790 Broadway

New York City

MARMON
"The Easiest Riding Car In The World"

41	48
\$3250	\$5000
152" Wheelbase	145" Wheelbase

Nordyke & Marmon Company
Indianapolis (Established 1851) Indiana
"Over Sixty Years of Successful Manufacturing"



HEINZE MAGNETOS are superior both mechanically and electrically. Equip with HEINZE and your ignition requirements will be satisfied.

HEINZE ELECTRIC COMPANY
Factories—Lowell, Mass. Sales Offices—Detroit, Mich.
Branch Offices—New York, Detroit, Chicago, Minneapolis.
New England Agent—Arthur Patch Homer, Boston, Mass.

**Steel
Protectors**

Each section 2" wide $\frac{1}{8}$ " thick. They hook to rim. As flexible as ever. Anti-skid, can't blow out or rim cut.

HOW CAN THE RUBBER WEAR OFF
IF IT IS COVERED WITH STEEL?

Try 2 or 3 sections over any old blowout
Special prices to the first in new territory

Kimball Tire Case Co. ¹⁷³ Council Bluffs, Ia.

NATIONAL
RADIATORS

The Improvement in RADIATORS
NATIONAL CAN COMPANY, Detroit, Mich.

**THERE IS MORE POWER IN
THAT GOOD GULF GASOLINE
AND
SUPREME AUTO OIL**

MANUFACTURED BY
GULF REFINING COMPANY
PITTSBURGH, PA., U. S. A.

Dealers—Write for our attractive proposition.
Send for our free booklet "Progressive Lubrication."

SALISBURY

AXLES WHEELS
PROPELLERS

Salisbury Wheel & Mfg. Co.
JAMESTOWN, N.Y.

April 8, 1915

MOTOR AGE

83



GARDNER "MIDGET"

The Pump Every
Owner Can Afford

Simple, durable, dependable. Few parts, no adjustments, can't get out of order. Only attention is filling crank case with oil once or twice a year.

Write for "Midget" circular AC-10, also describes a complete electrical pumping unit.

The Gardner Governor Company 118 Williamson St.
QUINCY, ILL.
The Gardner "Gee Gee" for the Public Garage

A PAYING INVESTMENT For Every Garage or Repair Man

Whoever shows the greatest speed and best service in handling emergency calls from disabled cars on the road gets the paying repair trade and good will of his community.

Autorescue



The attachment is very simple in either case of broken spindle, front or rear wheel or axle. If front wheel spindle is broken you can drive car under its own power.

Agents—Repair and Garage men will buy AUTORESUCE. Good profit for you. WRITE.

AUTORESUCE MFG. CO.

Streator, Ill.



For Tops, Curtains and Upholstery

The Recognized Standard in Rubberized Cloths

Guaranteed not to leak or fade

So attractive in appearance—they help to sell
the car

Send for 1915 Samples

Prices Right
Any Quality
Prompt Shipments



The Guaranteed Parker Shock Absorber

\$20—\$25
Ford
\$12.50



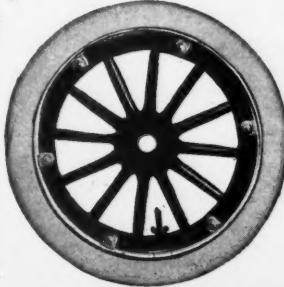
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RUPE & KEMP

1215 S. Franklin Street MUNCIE, INDIANA



Ford Demountable Wheels



with one extra
rim, complete,
set \$14.00

We will allow you \$0.75 each for
your old wheels if not cracked
or broken.

Auto Parts Co.
737 Jackson Blvd., Chicago

ELECTRIC SYSTEM

SINGLE DISCO

DISCO ELECTRIC STARTER COMPANY DETROIT MICH

Electric Starting & Lighting System

Spins This Motor

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Schrader

For sale by Tire Mfrs., Jobbers and Dealers or
A. Schrader's Son, Inc.
782-791 Atlantic Ave., Brooklyn, New York



MARCH 1, 1906, JULY 6, 1909, OTHER PATS. PENDING
SCHRADER UNIVERSAL
TRADE MARK REG. IN U.S. PAT. OFFICE
TIRE PRESSURE GAUGE



WINTON SIX

The charm of the Winton Six—so notable in its exterior beauty—is especially appealing in what is most valued by the owner—that is, in its manners. You can be absolutely sure of your Winton Six every time, everywhere. It is always a car of satisfying behavior. And you may write your own guarantee.

THE WINTON MOTOR CAR COMPANY
424 Berea Road, Cleveland, Ohio
World's First Maker of Sixes Exclusively

Hand Pumping Is Just Physical Torture!

Every customer you have knows this to be a fact. He hates the job. It's easy to sell him a

MAYO SPARK PLUG PUMP

Price, complete with 12 ft. hose and gauge, \$10. MAYO Q. D. Spark Plug, \$1.50 extra. MAYO Ford PUMP, \$8.00. MAYO Valve Cap PUMP, \$15.00.

Sold on 30-Day Free Trial
Write

MAYO MFG. CO.
65 E. 18th St., CHICAGO



No Garage Can Do Without

the means to determine promptly the exact condition of the electrical equipment of any automobile.

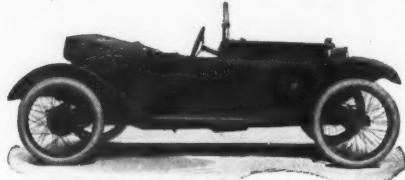
Weston

ELECTRICAL TESTING INSTRUMENTS

are absolutely dependable in locating trouble in starting and lighting systems, or proving its absence. Built to conform in every way with the exacting Weston standard, they are accurate, serviceable, reliable, yet inexpensive. Write for special booklet describing Model 280.

WESTON ELECTRICAL INSTRUMENT CO.
NEWARK, N. J.

The Cornelian Light Car



Speed Comfort Beauty Safety
"The Car with a Future"

BLOOD BROS. MACHINE CO.

ALLEGAN, MICHIGAN

Formerly of Kalamazoo

HOLLIER
\$985 EIGHT \$985
It leads the leaders
THE LEWIS SPRING & AXLE CO.
JACKSON, MICHIGAN

Write
to-day for our
Territorial Agreement
on the

New \$1000 Inter-State "FOUR"

The one popular priced car with
the greatest selling arguments
in the country.

Inter-State Motor Co.
802 W. Willard St.
MUNCIE, IND.

HOUK
Detachable
WIRE WHEELS

"The wheel that makes any car modern"

HOUK MANUFACTURING COMPANY
1702 Elmwood Avenue, Buffalo, N. Y.

KISSELKAR

The Big Values of the Year

36-Four—\$1450
42-Six—\$1650
48-Six—\$2350

For all-year driving get the Kissel Detachable Sedan Top for but \$350 additional.

KISSEL MOTOR CAR CO., 121 Kissel Ave., Hartford, Wis.

- Every Inch a Car -

Link your motor to the BIG BOY—a big plug for big deeds. Guaranteed forever, because it's a—



THE ROBINSON MFG. CO.
503 Lincoln Bldg., Louisville, Ky.

WE NOW OFFER The Searchlight Welder

A complete outfit for Oxy-Acetylene
Welding
at
\$50.00

High in Quality

Low in Price

Write for complete information to

THE SEARCHLIGHT COMPANY
1016 Karpen Building, Chicago, Ill.

Add to Garage Profits by Oxy-Acetylene Welding

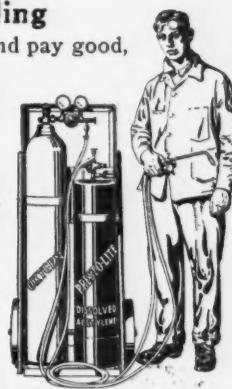
Savings made please your patrons and pay good, substantial profits.

PREST - O - LITE

Dissolved Acetylene (Ready-made carbide gas)

adds to the efficiency and usefulness of any good welding equipment. We furnish thoroughly high grade welding apparatus for \$60.00. The average user will also need gas cylinders at an additional cost, and about \$10.00 worth of welding supplies. Truck and special equipment for cutting operations at extra cost. Send for details of Prest-O-Lite Service for Oxy-Acetylene Welding.

The Prest-O-Lite Co., Inc.
The World's Largest Makers of
Dissolved Acetylene
233 Speedway Indianapolis, Ind.



ZENITH CARBURETOR

For seven years the
unchanging standard
of quality motor
vehicles

Detroit
U. S. A.



Own the vulcanizer you're paying for.

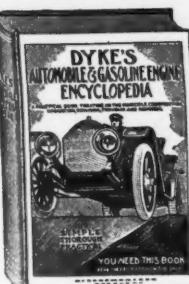
Yes, paying for it in
repair bills and tire service
that you don't get. You
buy two tires where one
would do as well.

SHALER Vulcanizer

Mends tubes and casings perfectly. You or your chauffeur can use it. Prices \$2 and up.

One free copy of "Care and Repair of Tires" if you write at once. Tells what you need to know about tire-saving devices.

C. A. SHALER CO., 214 Fourth St., WAUPUN, WIS.



Here's the Book You Need

—tells you how to diagnose and remedy any trouble.
—teaches you the principle of all engines, valves, carburetors, ignition, self-starters—in fact, everything you want to know.
—teaches you to overhaul a car from the ground up.

NOTE—The 1914-15 Book is now ready with a new Supplement on the principle, construction, operation and care of leading 1915 Electric Starting, Generating, Ignition and Lighting Systems. Delco, Atwater-Kent, Bosch "two point" and other systems are simplified.

SPECIAL INSTRUCTION on Six and Eight-Cylinder Engines.

Price, \$3.00 (add 25¢ to prepay)

If not satisfactory, return

Book Dept., Class Journal Co. Chicago
910 Michigan Ave.

HERE'S
YOUR REPAIRMAN,
reference, guide and
instructor.

1200 illustrations. 732
pages. 46 instructions.

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RAJAH WINS AGAIN

1st and 2nd place at Los Angeles

In the Venice Grand Prize Race, March 17, 1915, Maxwell (Oldfield) finished 1st with RAJAH PLUGS. Maxwell (Carlson) finished 2nd with RAJAH PLUGS. It's the same old story—Rajah Plugs not touched during the entire race.

Here's the Reason: "Ignition Absolutely Sure"
Rajah Giant Plug, \$1.50 postpaid

RAJAH AUTO SUPPLY CO., Bloomfield, N. J.

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ONE MINUTE FORD TIRE TOOL

This tool will positively completely change a Ford clincher tire in one minute without labor. Postpaid for \$1.00. Dealers, send for circular and dozen price.

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PAINT YOUR AUTOMOBILE YOURSELF
Successfully and satisfactorily by our system and instructions. Everything necessary included. You save \$25 to \$55. Send for free booklet.

JOHN J. GREENE CO. Carbondale, Pa.

Paint Your Car Yourself

Save \$25 to \$75 by doing the work at home with the Arsenal system. Our big free booklet, "The Car Beautiful," tells how. Send for it today.

Arsenal Varnish Company
Auto Dept. Rock Island, Ill.

PISTON RINGS

Lap joints, ground finish, individually cast, at 25c each. Triple rings for more compression and economy of fuel at 90c each. Grossman Auto Parts Company, White Plains, N. Y.

QUALITY

is what we furnish in Automobile material. You must consider price too.

Let us get together and you will get quality at a big saving.

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We have a large quantity of wheels on hand. We will close out the following sizes this week. They are all new wheels—CADILLAC, FORD, MAXWELL—and will fit many other cars.

34x4 Q. D.	\$ 2.00
34x4½ Q. D.	2.00
30x8½ Q. D.	2.00
30x3 Ford clincher	1.50
30x3½ Ford clincher	2.25
30x3½ Maxwell	2.00

DEMOUNTABLE WHEELS

Ford 30x3½ with extra rim, complete set. 18.00
Maxwell, with extra rim, complete set.... 18.00

We can also furnish the above wheels with Baker rims. You want demountable wheels on your car. We can build them for any car. Write for particulars.

FORD DIFFERENTIAL GEARS

Ring gear, standard.....	8.75
Pinion, standard.....	1.25
Complete set 2 1/2 & 3 to 1 ratio, price per set	12.00

FORD CROWN FENDERS

Complete set of 4, enameled..... 12.00

RADIATORS—GUARANTEED

Ford model T honeycomb.....	18.50
Ford model T "V" shape.....	23.50
1915 Oakland "V" shape.....	25.00
Oakland 42 "V" shape.....	25.00
Hupp 20 honeycomb.....	25.00
Buick radiators—all models. Write for prices.	

SPARK PLUGS—GUARANTEED

½" standard and ¾" A. L. A. M.....	.16
Per doz.	1.80

TOPS

Ford Model T, complete with curtains and boot	16.00
Ford roadster top, complete.....	12.50
Mohair tops for all cars, write for circular.	

MISCELLANEOUS

Baker and other demountable rims—all sizes	
Jacox steering gear, 18" wheel.....	10.00
Gemmier steering gear, L. H. drive.....	8.00
Model A, Splitdorf m. netos.....	13.50
6-Volt Deaco lighting generators.....	15.00
11" Electric head lamps.....	8.00
Steam vulcanizers, for all casings.....	2.35
Springs for all cars—get prices.	
Kingston carburetors for Fords.....	2.00
1 ¼" Marvel carburetors.....	3.00
Schebler and Stromberg carburetors, all sizes.	

2 ¼" spring clips, per doz..... .50

Battery and tool boxes, all sizes, \$1.50 and up

3-Speed sliding gear transmissions. Brand new and complete..... 50.00

Bucket seats complete, per pair..... 18.00

Tires all sizes.

Most everything for the Automobile.

WRITE FOR BULLETINS

Automobile Specialty Company

999 Woodward Avenue

DETROIT, MICH.

Prest-O-Lite Gas Tanks B, \$10.50, Black and Nickel Windshields, \$6, Ford Gas and Electric Head Lamps, \$3.25 pair; Spark Plugs, \$0.25. One-third with orders.

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RACING BODIES

Bucket Seats

AUTO REMODELING CO.
1501-5 Michigan Avenue Chicago, Ill.

RADIATOR BARGAINS

Ford Model T Tubular.	\$16.00
Ford Model T Honeycomb, V-shaped	25.00
Buick 16 and 17.	28.50
Buick 10.	20.00
Hudson 20, 32 and 33.	28.50
Chalmers 30.	30.00
Everett 30 Tubular.	14.00

Write for prices on any other makes

AUTOMOBILE APPLIANCE CO.
1436-38 S. Michigan Ave., Chicago, Ill.

Radiator Bargain

in Studebaker Radiators

We have a quantity of radiators for Studebaker cars on hand, and offer them for immediate sale at an exceptionally low cash price.

Every one is a new Fin and Tube radiator, guaranteed to fit.

Studebaker 35..... \$23.50

E. M. F. 30..... 23.50

Studebaker 25..... 19.50

Send in your check now—They won't last long

Detroit Radiator & Specialty Co.
963 Woodward Ave. Detroit, Mich.

RADIATORS

NEW GUARANTEED

Ford T.....	Tubular. \$17.00	Honeycomb. \$19.50
Buick 10.....	19.75	22.50
Hudsons, 20-33.....	29.00	29.00
Overlands.....	31.00	33.00

We have radiators, both tubular and honeycomb, to fit any car. Write us for prices before buying. Send in your old radiator for repairs. We are experts. We'll make allowances on your old radiator.

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in automobiles and accessories. Send for the great

PRICE WRECKER

the money saver, covering everything pertaining to an auto.

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Write for Descriptive Catalogue and Samples

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Saves Gasoline and Oil-Increased Compression. Used in all Engines—Used for circular. W. V. SMITH, Sole Manufacturer and Patentee, 421 Ave. A, Schenectady, N. Y.

The Clearing House—continued.

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10,000 storage tanks, 50-10,000 gallons capacity. 7,500 tool kits for Fords and larger cars. Lathes, Drill Presses and all other small and large machine tools. Equipment of every kind for garage owners and repair men. Write for complete list of snaps. No. MB-146.

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Owners Chicago House Wrecking Company
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The ONLY Known Concern Repairing Broken Speedometer Shafts; any make repaired.

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OUR POSITION IN THE AUTOMOBILE INDUSTRY IS SUCH THAT WE ARE ABLE TO SELL AT ALL TIMES LOWER THAN ANYWHERE ELSE.

Easy Payments Arranged

A few special values include:—
New 5-pass. Touring Cars, electric light and self-starter, fully equipped; regular price, \$1,500; our price, \$810. New 5 and 7-pass. Touring, fully equipped; list price, \$1,750; special job, \$645. NEW KING ROADSTERS; regular price, \$1,500; our price, \$690. New Sampson delivery trucks, with express body, \$495.

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R A C E A B O U T	1913 model....\$600
like new.....\$600	STEARNS, 30-60....\$300
MERCER 1911 toy	C O L U M B I A
tonneau.....\$550	R O A D S T E R
CARHART 4 pass.	with gunboat
with elec. lights.....\$550	b o d y . c o s t
CADILLACS, all	\$2,750, price....\$500
models.....\$250 to \$800	CHALMERS 1912-
WESTCOTT touring,	1913 models,
cost, \$3,000;	\$450, \$675
is a snap.....\$250	STUDEBAKER
ITALIA raceabout.....\$300	for door, '12
RANIER limou-	model touring..\$250
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Hundreds of others too numerous to mention. New Herschel-Spillman Motors, 4 and 6 cylinder, \$275; other motors, \$65 up. \$300 foredoor touring bodies now \$80. Runabout bodies 1914 Ford, new, \$35; others \$40 and \$50. Runabout tops \$15. Touring \$25 (measurements blank sent on request); Racing Seats \$10 each. Spicer Universal joints \$4 each; mechanical oilers \$4 up; windshields \$5 up. Special nickel 1-piece Rainvision shield \$10; Disco self-starter \$5; Remy Complete dual system magnetos, Model R. L. and R. D., \$25; others \$5 up; Rayfield, Stromberg and Schebler carburetors \$5 up; gloves \$1 up; Raccoon Fur coats (special bargain), \$18; double plush robes, \$3.50 each. Bulb horns, 75¢; electric horns, complete with wire and button, \$1.95; hand horns (mechanical), \$1.50; exhaust horns (all sizes), \$2.50; spark plug pumps, \$5; double action pumps, \$1.75.

Send postal for latest catalog called "Price Wrecker" No. 8. 3,000 money saving reductions for automobileists.

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Sure-Go Ford Fan Belt

Made of web and leather. Web on outside prevents stretching leather on inside. Makes smooth wearing surfaces. Ask the dealer, or send us 50c for sample.

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LINCOLN, NEBRASKA
Manufacturers

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We Bought Supplies

275 Paper covers for motors....	.50
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Krit Motors only.....	125.00
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Krit North East Starters.....	45.00
Krit Dynetos.....	25.00
Krit Universal Joints.....	5.00
Krit Tops, mohair.....	15.00
Krit Dem. Wheels, 32x3½, per set, with one extra rim.....	20.00

STOP! LOOK! LISTEN!

4-cyl. 4-cycle 4-passenger cars complete with top, side curtains, windshield, speedometer, extra wheel, generator, gas lamps, oil lamps, ready to run.

HERE IS YOUR LAST CHANCE THIS YEAR TO BUY CARS SO CHEAP

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Will sell the first 10 for.....	\$300 each
Second 10 for.....	310 each
Third 10 for.....	320 each
Fourth 10 for.....	330 each
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SEND YOUR ORDER AT ONCE

Money will be promptly refunded if cars are sold. Reference—State Bank of Chicago. Thousands of other parts. Send for list.

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"THICK-O GUM SHELLAC"

Absolutely pure Orange Shellac (no rosin), cut very thick and heavy in denatured grain alcohol, put up in double friction top cans. One doz., ½ pint, \$1.30, you pay charges. One doz., ¼ pint, 90c, you pay charges.

THINK OF IT—Shellac positively guaranteed to be cut at rate of six pounds to a gallon.

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PRINCETON, ILLINOIS

We Tear 'Em Up and Sell the Pieces

We Can Save You Money on Repair Parts or Supplies for Your Auto

We also buy old autos—condition no object—or any part of an auto, or if you want to trade parts we will trade with you

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Empire 1912, 20 H. P.....	\$ 75.00
Bergold 1913, 30 H. P. Unit Power Plant.....	150.00
Jackson 1910, 40 H. P. Unit Power Plant.....	150.00
Standard 1910 6 cyl. 50 H. P.....	100.00
2 Cyl. Motors.....	\$25.00 to \$50.00

Can supply you with Crank Cases, Crank Shafts, Cam Shafts, Cylinders, Pistons, connecting Rods, Radiators, Gears (any style), Timers, Magneto, Coils, Carburetors, Manifolds, Water Pumps, Transmissions, Rear and Front Axles, Wheels, Steering Gears (complete), Steering Wheels, Gasoline Tanks, Wind Shields, Springs, Bodies, Seats and Cushions, Jacks, Tires and Tubes, Head Lamps, Side Lamps and Tail Lamps (any style), Prest-O-Lite and Search Light Tanks, Horns, Mufflers—in fact, any part of an auto.

OUR GUARANTEE TO ALL—IF NOT SATISFIED WITH YOUR BARGAIN, RETURN AND WE WILL REFUND YOUR MONEY.

AUTO WRECKING CO.

Old Church, 13th and Oak

KANSAS CITY, MO.

WHEELS For any car or Truck. New FORD Wheels with 30x3½ Clincher rims, \$2.45 each, net.

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Where the Enamel Finish Is Dull, Cracked or Chipped use Peerless Extra Fine Black Japan for all around work on wood or metal. Air drying over night. Ask your dealer.

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PARTS AND ACCESSORIES WANTED

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Five passenger body and top to fit. 1913 Jackson Majestic Model 43, send cuts and prices.

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ALL OUR RADIATOR REPAIRING GUARANTEED. New Radiators, Hoods, Fenders, Tanks and New Cores installed in old radiators at bargain prices.
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A New Radiator or Your Old One repaired. Repairs in one day—a new radiator in two days. We are specialists also on fenders, hoods, gas tanks, lamps, and all auto sheet metal work.

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AUTOMOBILE RADIATORS MANUFACTURED Radiators to fit any car shipped in three days. We fit new core, or any parts in any radiator. Frozen and smashed repaired and returned promptly. All work guaranteed. Sheppard Mfg. Co., 1331 Jackson Blvd., Chicago, Ill.

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 We are the only radiator manufacturers in Chicago making a square tube radiator. New guaranteed cores placed in old radiators. We also manufacture Hoods, Fenders, Tanks and Pans and do guaranteed repair work. Prompt service.

M. & L. Auto Sheet Metal Works
 Rebuild and repair radiators, hoods, fenders, tanks, lamps, etc. Tel. Calumet 2848.

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Have stood the test of years—most durable and efficient. Get the best at less cost than others. Don't order until you send for our prices, and illustration of construction. Honeycomb and Bridge Fin Types (tubular). All standard makes in stock. Exceptionally low price on Fords. Dealers' discount.

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 Repaired by electricity. Filled with silver composition. Same piston and rings used. No warping of cylinders. Also welding.
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Everready Automatic Engine Starter. General machine work for foreign and American cars. Welding of all metals. Manufacturer Catelein Hose Coupling.
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on automatic machinery by skilled mechanics at prices that will interest you. Gears, axles, valves and parts of all kinds made of high grade alloy steel. Send us your worn or broken parts and we will replace them.

Oxy-Acetylene Welding
 of cracked cylinders a specialty

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CYLINDERS REBORED

Including new pistons and rings, \$7 to \$11 per cylinder. General overhauling and repairing.

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Cylinders, Crank Cases, and Crank Shafts Welded.

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Crankshafts, Crankcases, Connecting Rods, pistons, scored cylinders made equal to new with our New Silver Iron process—use the same piston and rings.

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CYLINDERS REBORED AND REGROUND

Fitted with my light pistons and leakless rings.

Watch this space for the most startling announcement, my latest invention in a light PISTON.

THE LEAKLESS PISTON RING FACTORY

McCADDEN MACHINE WORKS
 ST. CLOUD, MINN.

CYLINDER REGRINDING

Including New Pistons and Rings. All makes, \$5.00 per Cylinder. Write

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 32 Lark St. Buffalo, N. Y.

CYLINDERS REGROUND

and fitted with Special Composition heat-treated rings and heat-treated pistons, \$7.00 to \$15.00 per cylinder. Ford cylinders reground and fitted with Standard weight pistons, \$18.00. Special light pistons, \$24.00. Oxy-acetylene Welding.

BERNHARD & TURNER AUTO CO.
 Des Moines, Iowa

CYLINDERS REGROUND

Including new pistons and rings for \$5 to \$11 per cylinder. We do this class of work exclusively and are thus able to give you the highest class of work at these prices. Ford cylinders reground, including new pistons, rings and wrist-pins, for \$20.00.

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NICKEL PLATING

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Restore the Power and Snap of Your motor by having the cylinders reground, new pistons and rings \$7 to \$11 per cylinder. Ford cylinders reground, new pistons and rings \$15 per set. Oxy-Acetylene Welding. Work guaranteed.

Established 1897

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TWO DRIVERS wish positions of driving with party or private family. Have driven over all kinds of mountain roads in Wyoming, Montana and South Dakota. Can furnish the best of references.

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By a first class mechanic capable of handling men and taking charge of repair department or service station.

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WANTED

Position as auto repairman. A graduate of A. L. Dyke's School of Motoring, St. Louis, Mo. Have had experience in overhauling cars.

FRANCIS KELLOGG, Strawberry Point, Iowa

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In Guaranteed and Used Tires

Size	Used	New	Size	Used	New
30x3	\$4.50	\$ 6.00	34x4	\$ 9.00	\$12.90
30x3 1/2	6.00	7.80	34x4 1/2	10.00	17.60
32x3	7.00	8.75	36x4 1/2	11.00	17.90
33x4	9.00	11.85	37x5	12.00	21.00
10% deposit with order. Balance C. O. D. subject to examination.					

ACME TIRE AND REPAIR CO.
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DOUBLE TREAD YOUR WORN OUT TIRES

And Make Them Puncture-Proof
 By our method of reclaiming tires we combine two old tires into one serviceable one and subsequently give the owner from

2000 to 5000 Additional Miles
 out of his old tires. The combination of two tires adds a Puncture-Proof feature, inasmuch as the inner tire takes the air while the outer tire takes the road wear.

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See that one has a good bead, the other a good tread. The cost will range from \$2.00 to \$4.00, according to size. Should you have only one suitable tire we can furnish another costing from \$4.00 to \$9.00.

We pay express charges on receiving your old tires and return C. O. D. subject to inspection. In case you have no old tires to send us we can sell you Double Tread Tires ready to run from 2000 to 5000 miles at the following prices:

Non-Skid	Plain	Skid	Non-Skid	Plain	Skid
30x3	\$ 5.00	\$ 5.50	36x4 1/2	\$11.00	\$12.00
30x3 1/2	6.00	7.00	34x3 1/2	7.00	8.00
37x5	11.00	12.00	32x3 1/2	7.00	8.00

For other sizes get our complete price list.

LEON JAFFESS

Double Tread Tire Expert

252 West 55th St., New York City
 Branch, 5904 Central Ave., Cleveland, Ohio

AUTO TIRES!! AUTO TIRES!!
 Tough tread tires. They average 5000 miles service. 30-3, \$6.50; 30-3 1/2, \$8.25; 32, \$8.35; 33-4, \$11.50; 34, \$12.00; 36, \$12.00. All other sizes Skids 10% additional. For 4000 mile guarantee add 10%. No money in advance.

TIRE SALES COMPANY, Buffalo, N. Y.

The Clearing House—continued.

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Send two of them to us at once and we guarantee you 2,000 miles by our re-claim system. Our method is to take two old casings, and by a simple process turn them into one sound one, thereby guaranteeing the owner 2,000 miles. This is a snappy proposition.

ASK US HOW

COWANS BROS.
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TIRES—Guaranteed 3500 Miles

Heavy Car Type

30x3	\$ 7.60	32x8 1/2	\$11.05	84x4	\$16.05
30x3 1/2	10.15	33x4	15.70	35x4 1/2	22.20

Deduct 10% and send cash with order

Other sizes in proportion

Consumers Tire Co., Indianapolis, Ind.

TIRES TIRES ALL FRESH SELECTED SECONDS

30x3	\$ 6.00	34x4	\$12.90
30x3 1/2	7.90	35x4 1/2	17.90
32x3 1/2	8.65	36x4 1/2	18.25
33x4	12.60	37x5	21.00

All other sizes in Stock. Non-Skid 10% extra.

All orders C. O. D. on APPROVAL.

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Take advantage of present low prices.

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Do You Know? Are You Sure?
This information mailed free. Send tire sizes,
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AGENTS WANTED

To solicit Nickel Plating of Automobiles, etc.
Big commissions.

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In automobile supplies wants live salesmen,
willing to carry samples, to sell full line of auto
supplies. Splendid opportunity to enter a new,
fast growing industry and connect with a grow-
ing concern. Experienced men preferred, but
will consider inexperienced men if possessed of
sufficient energy and selling ability. Replies
held confidential.

Address Box E 316 c/o Motor Age

To Sell Electric Vulcanizer Operating on 6-Volt
storage battery. New idea. Quick seller. Every
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\$50.00 weekly. Exclusive territory to producers.

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Live Garage, Dealer or Repairman to install
and handle sale of live selling automobile ac-
cessory. Quick sales, large profits. Reply quick
for proposition. The Noxal Co., 1400-1402
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WANTED—State or county agents to sell GROLL
Ford Auto Starters. Ford dealers and owners
doing big business with the GROLL. The best
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Expert welders on automobile parts. Manufac-
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OXWELD PROCESS of welding and cutting, in-
cluding welding cracked or defective cylinders,
crankshafts, housings, aluminum crank and
transmission cases, etc., etc. Estimates fur-
nished on job and contract welding and cutting
of all kinds.

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Oxy-Acetylene Welding, Automobile and
Machinery Parts
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Cracked Cylinders a Specialty
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others cannot do on parts of aluminum or cast
iron. Expert auto repairmen dismantle and re-
assemble jobs. Ship your worst smashed crank-
cases and cylinders to—

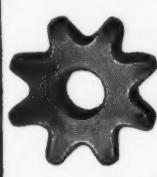
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WE SPECIALIZE

In placing and supplying High Grade Technical
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CHAINS AND DIFFERENTIAL
IN STOCK OR ORDER
SEND FOR NEW CATALOG
Cullman Wheel Co.



The TRUMP Ring

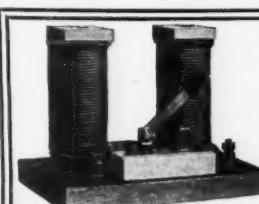
Increases power; uses less gas;
prevents carbon; saves oil.
Wherever there's a piston ring—
use TRUMP. Guaranteed. Write.

TRUMP MANUFACTURING CO., Crown Point, Ind.



YOUR HANDS WILL
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UZUM
Is it worth anything to you to be able to
Wash Your Hands
Without Water
When you are out on a trip in your automobile,
If your dealer does not carry UZUM send us 15¢
for full size can. We pay mailing charges.
Agents Wanted
For sale by leading garages, drug, harness, grocery and hardware stores
UNIVERSAL CHEMICAL COMPANY, Indianapolis, Indiana



ST. LOUIS MAGNETIZER

\$7.50

Recharges all kinds of magnets to origi-
nal strength from a 6-volt battery.

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ST. LOUIS ELECTRICAL WORKS
Arlington & Easton St. Louis, Mo.

The PARISH & BINGHAM COMPANY
PRESSED STEEL FRAMES
Write for Estimates

CLEVELAND, OHIO



FOR FORD CARS
FISHER ELECTRIC LIGHTING and
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Motor and generator combined in one com-
pact, self-contained unit, although acting
independently of one another. 12-volt,
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Make Old Cars Look Like New

Sold by dealers, garages, hardware stores, jobbers

Peerless Mohair Top Dressing

Waterproofs and renews old and leaking tops

Peerless Leather Top Dressing

Softens and renews old leather tops

Peerless Lining Dye

Makes a black, uniformly colored lining

Peerless Cushion Dressing

Brightens and renews cushion leather

Peerless Lamp Enamel—Gloss

A rich gloss finish—air drying

Peerless Lamp Enamel—Dull

A rich dull finish—air drying

Peerless Auto Body Polish

A renewer and polish for automobiles

Peerless Cylinder Enamel—Black

A gloss, air-drying, black enamel

Peerless Cylinder Enamel—Gray

A gloss, air-drying gray enamel

Peerless Jet Black Fender Japan

A heavy-bodied, rich black gloss enamel

Peerless Ford Top Dressing

Especially prepared for Ford tops

Peerless Anti-Rust Rim Paint

Keeps tires from sticking

Peerless Extra Fine Black Japan

Splendid covering enamel for all work

Peerless Mirroroid—A Varnish Renewer

A varnish applied with a cloth

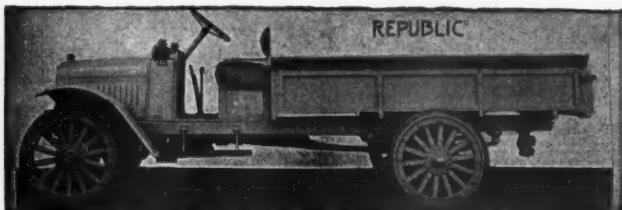
PRICES

1 gallon can.....	\$3.75
1/2 gallon can.....	1.98
1/4 gallon can.....	1.04
1/8 gallon can.....	.54

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The Columbus Varnish Company
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Republic Motor Trucks

The Fastest Selling Line of Motor Trucks in America

3/4-ton with express body, internal gear drive	\$ 995.00
1-ton chassis	1350.00
1 1/2-ton chassis	1475.00

The Vitals of the Republic

1 and 1 1/2-TON MODELS

Continental Motor	Russell Full Floating
Timken Axles	Jack Shaft
Bosch Magneto	Covert Transmission
Stromberg Carburetor	Standard Cone Clutch

Firestone Tires

No Better Units Built

We ask the opportunity to prove our statements.
Wire or write for catalog and complete information.

Republic Motor Truck Co., Alma, Mich.

Index to the

Atwater Kent Manufacturing Works.....	57
Auto Parts Company.....	83
Autorescue Manufacturing Company.....	83
Barnes, W. F. and John.....	48
Bearings Company of America.....	58
Blood Brothers Machine Company.....	84
Bosch Magneto Company.....	76
Boston Starter.....	82
Braender Rubber and Tire Company.....	81
Briston Manufacturing Company.....	86
Briscoe Motor Company.....	Cover
Brown Company.....	80
Chalmers Motor Company.....	63
Champion Spark Plug Company.....	43
Class Journal Company.....	68
Clearing House.....	87 to 93
Columbus Varnish Company.....	94
Connecticut Telephone & Electric Company.....	54
Continental Motor Manufacturing Company.....	81
Corcoran Lamp Company.....	86
Covert Motor Vehicle Company.....	1
Cullman Wheel Company.....	93
Cummins Auto Sales Company.....	2
Disco Electric Starter Company.....	83
Dodge Brothers.....	55
Double Seal Tire Valve Company.....	82
Dover Stamping and Manufacturing Company.....	95
Dyneto Electric Company.....	81
Eisemann Magneto Company.....	80
Electric Auto-Lite Company.....	73
Electric Spark Appliance Company.....	75
Empire Automobile Company.....	51
Federal Rubber Manufacturing Company.....	66
Fisher Electrical Works.....	93
Ford Motor Company.....	81
Fulton Company.....	79
Gabriel Horn Manufacturing Company.....	77
Gardner Governor Company.....	83
Garford Manufacturing Company.....	86
General Motors Truck Company.....	45
Gould Storage Battery Company.....	65
Grossman, Emil, Manufacturing Company, Inc.	85
Gulf Refining Company.....	82
Heinze Electric Company.....	82
Holley Brothers Company.....	86
Houk Manufacturing Company.....	84
Hyatt Roller Bearing Company.....	56
Inter-State Motor Company.....	84
Johns, H. W.-Manville Company.....	96
K. W. Ignition Company.....	78
Kimball Tire Case Company.....	82
Kissel Motor Car Company.....	84
Kokomo Electric Company.....	52
Larson and Hilker.....	74
Leece-Neville Company.....	80
Lewis Spring and Axle Company.....	84
Lexington-Howard Company.....	80
Lockwood-Ash Motor Company.....	95
Lovell-McConnell Manufacturing Company....	49
Manzel Brothers Company.....	59
Master Carburetor Company.....	86

Advertisements

Mayo Manufacturing Company.....	84
Metz Company.....	78
Miller Rubber Company.....	75
Moline Automobile Company.....	64
Mutty, L. J., Company.....	83
National Can Company.....	82
National Motor Vehicle Company.....	78
New Departure Manufacturing Company.....	46
New York and New Jersey Lubricant Company.....	86
Nordyke and Marmon Company.....	82
Oakes Company.....	80
Olds Motor Works.....	60
Osgood Autolite Deflector Company.....	80
Oxygen Generator Company.....	77
Parish and Bingham Company.....	93
Paro, H. G.....	79 and 81
Perkins-Campbell Company.....	81
Pittsburgh Model Engine Company.....	79
Platt and Washburn Refining Company.....	Cover
Post Office Notice.....	78
Prest-O-Lite Company.....	85
Rajah Auto Supply Company.....	85
Remy Electric Company.....	Back Cover
Republic Motor Truck Company.....	94
Republic Rubber Company.....	62
Robinson Manufacturing Company.....	85
Royal Equipment Company.....	83
Rupe and Kemp.....	83
Rutenber Motor Company.....	86
Salisbury Wheel and Manufacturing Company.....	82
Saxon Motor Company.....	53
Schrader's, A., Son, Incorporated.....	83
Scripps-Booth Company.....	72
Searchlight Company.....	85
Service Motor Supply Company.....	76
Shaler, C. A., Company.....	85
Sheldon Axle and Spring Company.....	67
Simplex Short-Turn Gear Company.....	86
Sparks-Withington Company.....	69
Speer Carbon Company.....	79
Sphinx Motor Car Company.....	81
Splitdorf Electrical Company.....	4
St. Louis Electrical Works.....	93
Standard Oil Company.....	61
Stewart Accessories Company.....	80
Stewart-Warner Speedometer Corp.....	64a to 64d
Stromberg Motor Devices Company.....	80
Tritt Electric Company.....	76
Trump Manufacturing Company.....	93
Universal Chemical Company.....	93
Universal Rim Company.....	50
Van Sicklen Company.....	71
Warner Gear Company.....	74
Westcott Motor Car Company.....	81
Weston Electrical Instrument Company.....	84
Wheeler and Schebler.....	44
Willard Storage Battery Company.....	47
Winton Motor Car Company.....	84
Woodstock Hotel.....	72
Zenith Carburetor Company.....	85

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Every Owner and Garage
Needs Them

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CAMBRIDGE, MASS., U.S.A.



PAZ OCT 22, 1912.

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It is a simple inconspicuous strut or radius rod which keeps the body and axle in perfect alignment under all driving conditions. Can be installed by any one in 15 minutes and lasts a life time. Makes your Ford steer and hold the road like a Packard.

Type "B" fits any standard Ford Car.....Price \$2.00
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L-A
STEADY STEERER



One Firm One Service One Guarantee back of every J-M Accessory —



Correct Time All the Time

The first high-grade, eight-day automobile time-piece to be offered at a popular price—

J-M AUTO CLOCK \$5

Guaranteed to keep correct time under every service condition. Movement mounted on extra strong pinions and entirely enclosed in dust-and-moisture-proof case. This locks automatically in an outer case which conceals winding and setting keys and attaching screws.

Handsome finished in black-and-nickel, black-and-brass or all black. Dial 3½" wide, either white or black. Choice of two mountings; dash board as illustrated or flush.

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Send for booklet*

3079



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Toronto Montreal Winnipeg

(3036)

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Ask us to tell you what it means to you to carry the line of Veedol motor oils. We will give you the actual facts of a most remarkable advertising campaign—unusually effective because it is waged directly over the names of our dealers. It serves their interests as closely as possible without cost to them. We advertise the dealer himself and pay the entire expense.

After the Veedol advertising has created the demand and made customers for our dealers the superior quality of the Veedol oils makes all the sales permanent. No Veedol oil leaves the Refinery before it has been proven absolutely right, chemically, physically and practically.

Literally thousands of tests have been made to determine the best grade of Veedol for each type and make of motor. The results of all these tests have been charted. These charts, together with actual photographs and illustrations of the tests, are all presented in our new 44-page Veedol Book.

Before you invest your money in any other oil this season let the Veedol salesman explain all we do for you in the way of advertising. Write today for a copy of the Veedol Book and special descriptive portfolio of the Veedol advertising plan.

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Incorporated 1885

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